LEGISLATIVE COUNCIL

SELECT COMMITTEE ON THE FEASIBILITY OF UNDERGROUNDING THE TRANSMISSION INFRASTRUCTURE FOR RENEWABLE ENERGY PROJECTS

Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects

March 2024

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Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects

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Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects

"March 2024"

Chair: Ms Cate Faehrmann MLC

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Terms of reference

1. That a select committee be established to inquire into and report on the feasibility of undergrounding the transmission infrastructure for renewable energy projects, and in particular:

    (a) the costs, benefits and risks of underground versus overhead transmission lines, particularly with regard to bushfire and other weather-related events, ongoing environmental impacts, and community mental health and welfare

    (b) existing case studies and current projects regarding similar undergrounding of transmission lines in both domestic and international contexts

    (c) any impact on delivery timeframes of undergrounding with broad community consensus versus overhead transmission with large scale opposition

    (d) any other related matters.

2. That the committee report by 31 March 2024.

The terms of reference for the inquiry were referred to the committee by the Legislative Council on 13 September 2023.[1]

[1] *Minutes*, NSW Legislative Council, 13 September 2023, pp 471-472.

Committee details

Committee members

Ms Cate Faehrmann MLC	**The Greens**	*Chair*
Hon Wes Fang MLC	The Nationals	*Deputy Chair*
Hon Mark Buttigieg MLC	Australian Labor Party	
Hon Susan Carter MLC	Liberal Party	
Hon Stephen Lawrence MLC	Australian Labor Party	
Hon Rod Roberts MLC	Independent	
Hon Emily Suvaal MLC	Australian Labor Party	

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Chair's foreword

It is undeniable that electricity generation and transmission in New South Wales is currently undergoing significant change, as we shift from a reliance on aged coal-fired power generation assets and fossil fuels to a more sustainable renewable energy system, to support both legislated Net Zero and renewable energy targets. It is also undeniable that this is putting significant strain on those regional communities who will be required to accommodate the bulk of the renewable energy infrastructure required for this ambitious, and necessary, transition.

This inquiry sought to provide a balanced assessment of overgrounding and undergrounding electricity transmission, following on from an earlier inquiry by the State Development Committee in 2023. However, undergrounding's limited uptake in Australia, particularly at the scale of the transmission projects we examined – HumeLink and Central West Orana - made the task challenging. We therefore recommend that the NSW Government commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology and to understand the existing capacity of the domestic workforce skills and manufacturing industry.

On costs, we heard repeated concerns that the cost of undergrounding transmission infrastructure will increase consumers electricity bills through flow-on costs because of the regulatory requirement for consumers to bear the costs of transmission infrastructure. We are of the view that this is unfair and should be remedied. Therefore, we have recommended that the NSW Government consider regulatory reform that will ensure a fairer sharing of the financial costs of electricity transmission infrastructure, so that costs are not solely borne by the consumer.

We also heard from multiple stakeholders about their concerns regarding the potential for transmission lines to cause bushfires. However, we also heard that 550KV overhead transmission lines have not been the cause of bushfires. It cannot be contested though that many landholders hold serious concerns about the impact that overhead transmission lines could have on firefighting efforts on their properties and surrounds. Concerns were also raised about the potential for extreme weather events, like bushfires and strong winds, to damage overhead transmission lines. I am pleased that the committee has therefore recommended that the NSW Government work with the Commonwealth Government to ensure that electricity transmission providers develop climate adaptation plans so that their infrastructure and the wider network is built with the resilience to withstand more frequent and extreme weather events.

It is resoundingly clear that transmission infrastructure providers are failing to secure the social licence necessary for their proposed new projects in regional areas. Unsurprisingly, we identified a need for transmission companies and agencies to improve their community engagement at every stage of transmission infrastructure projects. On undergrounding specifically, we found that electricity transmission providers and the NSW Government should provide more information to adequately explain the options to the community, relating to undergrounding transmission lines versus overhead transmission lines, in the broader context of the NSW Government's legislated Net Zero and renewable energy targets. We also recommended that the Department of Planning consider amending the relevant guidelines to require early, genuine and ongoing community engagement, to assist parties completing required environmental impact statements.

One option we sought to understand further was the viability of a hybrid approach to transmission infrastructure; that is, using overground and underground technology at different points of the project. The committee came to the view that there is merit in exploring a hybrid approach to transmission infrastructure projects to better address sensitivities, from environmental to cultural to social, wherever practicable. To this end, the committee recommended that the NSW Government work with Transgrid

and EnergyCo to consider opportunities for a hybrid approach when completing transmission infrastructure projects.

It's clear that the regulatory environment, the cost burden on consumers and a lack of progress in building a domestic workforce with skillsets in undergrounding may have resulted in a reluctance to shift away from the 'status quo' when investing in the future of electricity infrastructure within Australia. I strongly encourage the Government to consider the evidence and findings of this report and to give legitimate consideration to increasing the resilience of the electricity infrastructure network, through hybrid transmission infrastructure, where practicable.

Finally, I would like to thank individuals and organisations who contributed to the inquiry, through their submissions and appearing at the inquiry hearings, and the secretariat for their support and diligence in assisting with the inquiry. I also thank members from the government, opposition and crossbench in their willingness to come together in good faith to produce a report that, I hope, provides recommendations that the government will adopt in the same good faith.

Ms Cate Faehrmann MLC
Committee Chair

Findings

Recommendations

Recommendation 1 **18**

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.

Recommendation 2 **19**

That the Department of Planning consider further amending the relevant guidelines to require early, genuine and ongoing community engagement in the preparation of an environmental impact statement.

Recommendation 3 **49**

That the NSW Government consider regulatory reform that will ensure a fairer share of the financial cost of electricity transmission infrastructure, so that it is not solely borne by the consumer.

Recommendation 4 **50**

That the NSW Government work with the Commonwealth Government to ensure that electricity transmission providers develop climate adaptation plans for their energy infrastructure to ensure that the State's energy transmission networks are built with the resilience to withstand more frequent and extreme weather events.

Recommendation 5 **50**

That the NSW Government commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology, the existing capacity of the domestic workforce and industry and the requirements for a domestic manufacturing industry.

Recommendation 6 **51**

That the NSW Government work with Transgrid and EnergyCo to:

- consider opportunities for a 'hybrid' approach for transmission infrastructure projects, and
- explore ways to better support the use of undergrounded transmission, to address sensitivities wherever practicable.

Recommendation 7 **51**

That, in order to improve community engagement practices and social licence around renewable energy transmission projects, EnergyCo look for ways to further enhance its relationship with the Energy Charter.

Recommendation 8 **52**

That the NSW Government work with the Commonwealth Government to develop and implement a plan to ensure the community is genuinely engaged around transitioning our electricity infrastructure to renewable energy, including the costs, benefits and opportunities of new energy infrastructure required to achieve the Government's net zero goals.

Conduct of inquiry

The terms of reference for the inquiry were referred to the committee by the Legislative Council on 13 September 2023. On the same day, all evidence from the previous Standing Committee on State Development inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects was referred to the committee.

The committee received 81 submissions and three supplementary submissions.

The committee held two public hearings: two at Parliament House in Sydney.

Inquiry related documents are available on the committee's website, including submissions, hearing transcripts, tabled documents and answers to questions on notice.

Chapter 1 Background

This is the second inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects conducted in the 58th Parliament. The first State Development Committee inquiry, conducted in the 57th Parliament, focused on the transmission network and the investment in transmission projects in New South Wales designed to support the need for additional network capacity to connect renewable energy projects as coal-fired power stations reach end-of-life.

This Select Committee inquiry has further investigated the feasibility of undergrounding the transmission infrastructure for renewable energy projects. This committee went to considerable effort to seek expert advice and opinions on undergrounded transmission infrastructure, to better understand and investigate professional and international practice. This is despite the difficulty experienced by the committee in obtaining insights on the topic of undergrounded infrastructure within Australia.

This chapter provides a timeline of key events both prior to and during this inquiry as well as recent developments in renewable energy transmission.

Timeline of key events

1.1 The Standing Committee on State Development commenced its inquiry ('the first inquiry') into the feasibility of undergrounding the transmission infrastructure for renewable energy projects on 22 June 2023, with the terms of reference having been referred by the Minister for Climate Change, Minister for Energy, Minister for the Environment, Minister for Heritage, Leader of the Government in the Legislative Council on 19 June 2023.[2] Hearings were held at Parliament House, Sydney, in addition to regional hearings in Tumut, Armidale and Deniliquin.

1.2 On 31 August 2023, the NSW Premier confirmed the electricity transmission infrastructure of the HumeLink project, connecting Renewable Energy Zone (REZ) to the NEM, would proceed utilising overhead transmission lines. Cited reasoning for the decision noted 'extensive increasing costs for energy prices in NSW'.[3]

1.3 The first inquiry report was tabled on the same day. The report found that the current plan for constructing HumeLink as a 500 Kv overhead transmission line is the correct approach especially given the applicable regulatory environment and the lack of any action to date in progressing the undergrounding option.[4] It also recommended that the NSW Government consider:

- the viability of changing the New South Wales planning framework to require impact studies to be undertaken prior to a REZ being declared and community consultation to commence at the REZ scoping stage

2 Minutes, NSW Legislative Council, 22 June 2023, pp 226-227.

3 Cait Kelly, Chris Minns rules out underground power lines for controversial HumeLink project due to cost, *The Guardian,* 31 August 2023.

4 Correspondence from Premier Chris Minns MP to the Clerk of the Parliaments, providing government response to the inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects, 30 November 2023.

- the creation of an independent ombudsmen to oversee, consultation upon, and rollout of, renewable energy project and transmission infrastructure and management related complaints. [5]

1.4 On 13 September 2023, the House resolved that the current Select Committee be established to further inquire into the feasibility of undergrounding the transmission infrastructure for renewable energy projects.[6] All evidence from the first inquiry was referred to the current Select Committee inquiry.[7]

1.5 The NSW Government response to the first inquiry was tabled in the House on 30 November 2023.[8] The two recommendations of the first inquiry highlighted above at 1.3. were supported in principle and supported respectively by the Government.

Notable developments since the first inquiry

1.6 This section covers developments to key energy transmission projects since the tabling of the report of the first inquiry.

Updates on the key projects

1.7 The HumeLink project is a large-scale energy transmission initiative being completed by Transgrid, with a proposed 385 km span of transmission lines, which will connect Wagga Wagga, Bannaby and Maragle in New South Wales. Refer to in Chapter 2 'Case Study – HumeLink' of the prior Standing Committee inquiry report for further context in relation to the HumeLink project.[9]

1.8 Prior to the conclusion of the first inquiry in August 2023, the Australian Energy Regulator (AER) approved funding for stage one part two of the HumeLink project. Approval of this funding allowed for the procurement of long lead equipment, being 'any asset that would take longer than 6 months to deliver',[10] including the purchase of transformers, reactors, conductors and steel towers.

1.9 Since the conclusion of the first inquiry, Transgrid has announced Acciona, GenusPlus Group Ltd, UGL and CPL Contractors as partners to assist with the delivery of the overhead electricity transmission infrastructure on 4 December 2023. As noted by Transgrid, these contracts will be

5 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), p 44, https://www.parliament.nsw.gov.au/lcdocs/inquiries/2966/Report%20No.%2051%20-%20Standing%20Committee%20on%20State%20Development%20-%20Undergrounding.pdf.

6 Minutes, NSW Legislative Council, 13 September 2023, pp 471-472.

7 Minutes, NSW Legislative Council, 13 September 2023, p 557.

8 Minutes, NSW Legislative Council, 30 November 2023, p 806.

9 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 9-35.

10 Australian Energy Regulator, AER Determination – *HumeLink Early Works Stage 1 (Part 2) Contingent Project* (August 2023), p 2.

delivered in two stages.[11] Stage one includes 'detailed design, investigations, procurement and project mobilisation',[12] and stage two includes the main construction works, with both stages subject to AER revenue determination and financing provisions.

Environmental impact statement updates

1.10 The HumeLink and Central-West Orana Renewable Energy Zone (REZ) transmission projects, were declared Critical State Significant Infrastructure (CSSI) projects by the Minister for Planning, as they are considered 'essential for the State for economic, environmental or social reasons'.[13] CSSI projects require consent under Part 4 of the *Environmental Planning and Assessment Act 1979* and Environmental Planning and Assessment Regulation 2021. A bilateral agreement exists between the Commonwealth and New South Wales Governments to assess the environmental impacts of such projects.

1.11 Since the first inquiry and at the time of writing this report, the current status of the Environmental Impact Statements (EIS) for these transmission projects, are as follows:

- HumeLink project – the EIS was lodged with the then-Department of Planning and Environment on 30 August 2023. Public exhibition of the EIS concluded on 10 October 2023, with public submissions now under review[14]
- Central-West Orana REZ project - the EIS was lodged with the then-Department of Planning and Environment in September 2023, with submission responses currently being made.[15]

Project status and commencement updates

1.12 As at the date of tabling this report, the environmental impact statements for both the HumeLink and Central-West Orana REZ projects were yet to be approved by the NSW and Commonwealth Governments (as required for Critical State Significant Infrastructure projects under a bilateral agreement).[16] Construction of the HumeLink project is currently set to 'commence in late 2024 and be completed by mid-2026'.[17]

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11 Media release, Transgrid, 'Transgrid announces construction partners for nation-critical HumeLink project', 4 December 2023, https://www.Transgrid.com.au/media-publications/news-articles/Transgrid-announces-construction-partners-for-nation-critical-HumeLink-project#:~:text=Transgrid%20has%20awarded%20%242.9%20billion,and%20CPB%20Contractors%20(JV).

12 Media release, Transgrid, 'Transgrid announces construction partners for nation-critical HumeLink project', 4 December 2023.

13 Department of Planning, *State Significant Development Guidelines* (October 2022), https://www.planning.nsw.gov.au/sites/default/files/2023-03/state-significant-development-guidelines.pdf

14 Transgrid, *About the HumeLink EIS*, https://www.Transgrid.com.au/about-the-HumeLink-eis

15 EnergyCo, Guide to the Environmental Impact Statement (September 2023), p 2, https://www.energyco.nsw.gov.au/sites/default/files/2023-09/cwo-rez-fact-sheet-eis-guide-to-the-eis.pdf.

16 Transgrid, About the EIS, https://www.Transgrid.com.au/about-the-HumeLink-eis.

17 Transgrid, *Factsheet: HumeLink Environmental Impact Statement* (August 2023), https://www.Transgrid.com.au/media/irkhizrt/guide-to-the-environmental-impact-statement-eis-august-2023.pdf, p 3.

1.13 Further, the Central-West Orana REZ transmission project is anticipated to commence in early 2025 and be finalised by 2027/28.[18]

Changes to the National Electricity Rules and regulatory investment tests review

1.14 As discussed further in chapter 2, the Australian Energy Market Commission (AEMC) makes and amends the National Energy Rules (the Rules), with compliance monitored by the Australian Energy Regulator (AER).

1.15 Under clause 5.22 of the Rules, the AER must make and publish cost benefit analysis guidelines for:

- AEMO in preparing an integrated systems plan, and
- RIT-T proponents in applying the RIT-T to actionable ISP projects.

1.16 In October 2023, the AER published new guidelines, parts of which impact HumeLink as an actionable ISP project for which an RIT-T must be applied. Regulatory investment tests (RIT-T and RIT-D) are cost-benefit analyses that must be performed prior to an electricity transmission or distribution service provider seeking approval from the AER for 'the costs associated with major capital projects, such as transmission projects'.[19] Whilst RIT-D applies to electricity distribution projects, RIT-T is exclusively required for electricity transmission projects. Further information and evidence relating to the RIT-T is addressed in chapter two of this report.

1.17 The final amendments to the RIT-T and RIT-D guidelines were published by the AER on 6 October 2023, incorporating additions to cost estimation, regulatory investment test reopening triggers and reapplication of reopening triggers of the RIT-T[20].

1.18 Broader changes were also made to the National Electricity Rules on 9 November 2023, when the AEMC published an amendment. The amendment introduced a 'more preferable final rule to enhance transmission network service providers (TNSPs) engagement with communities'. [21]

1.19 This amendment requires that stakeholders within the community be given the opportunity to be regularly involved in and engaged in 'actionable ISP [Integrated System Plan] projects, future

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18 EnergyCo, Central West Orana Energy Zone, December 2023 Project Update (December 2023), pp 8, https://www.energyco.nsw.gov.au/sites/default/files/2023-12/cwo-rez-project-update-dec-2023.pdf.

19 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), p 45, https://www.parliament.nsw.gov.au/lcdocs/inquiries/2966/Report%20No.%2051%20-%20Standing%20Committee%20on%20State%20Development%20-%20Undergrounding.pdf.

20 Australian Energy Regulator, *Cost benefit analysis guidelines – Guidelines to make the Integrated System Plan actionable* (6 October 2023), https://www.aer.gov.au/system/files/2023-10/AER%20-%20CBA%20guidelines%20-%20final%20amendments%20%28marked%20up%29%20-%206%20October%202023_0.pdf.

21 Australian Energy Market Commission, Enhancing community engagement in transmission building (9 November 2023), https://www.aemc.gov.au/rule-changes/enhancing-community-engagement-transmission-building.

ISP projects and REZ stages (as applicable)'.[22] This includes local landowners, local council, local community members, local environmental groups and traditional owners'.[23] These regulatory changes are not directly related to the issue of undergrounding.

Draft 2024 Integrated System Plan

1.20 On 15 December 2023, the Australian Energy Market Operator (AEMO) released its Draft 2024 Integrated System Plan (ISP), which is a planned roadmap for energy transmission within the NEM. This plan provides a framework for the delivery of 'essential infrastructure to meet future energy needs, balancing consumer risks and benefits'.[24] Consumer feedback was yet to be considered at the time of report tabling, however the Final 2024 ISP is due to be published on 28 June 2024.

1.21 The Draft 2024 ISP highlights plans of transformation of the NEM, with net zero emissions targets being considered along with system security, reliability and energy affordability.[25]

22 Australian Energy Market Commission, Enhancing community engagement in transmission building (9 November 2023), https://www.aemc.gov.au/sites/default/files/2023-11/final_rule_-_national_electricity_amendment_enhancing_community_engagement_in_transmission_building_rule_no._5.pdf.

23 Australian Energy Market Commission, Enhancing community engagement in transmission building Rule 2023 No. 5 (9 November 2023), https://www.aemc.gov.au/sites/default/files/2023-11/final_rule_-_national_electricity_amendment_enhancing_community_engagement_in_transmission_building_rule_no._5.pdf.

24 Australian Energy Market Operator, Draft 2024 Integrated System Plan (2023), p 16, https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/draft-2024-isp-consultation/draft-2024-isp.pdf?la=en.

25 Australian Energy Market Operator, *Draft 2024 ISP Consultation* (15 December 2023), https://aemo.com.au/consultations/current-and-closed-consultations/draft-2024-isp-consultation.

Chapter 2 Energy transmission in New South Wales and the regulatory framework for electricity infrastructure projects

This chapter begins by outlining the governance of the National Energy Market (NEM) and the system of energy generation in New South Wales. This is followed by an overview of the regulatory requirements on parties involved in electricity transmission infrastructure planning, including updates to these requirements in late 2023.

The second part of the chapter explores stakeholder views on these regulatory requirements, particularly the RIT-T process, as well as the views on the HumeLink and Central West-Orana Renewable Energy Zone environmental approvals. The chapter concludes with key concerns raised in relation to community consultation during these environmental approvals.

A broad overview of the National Electricity Market

2.1 The NEM was established to provide a wholesale market in which electricity can be traded between parties, such as generators and retailers. Formed in 1998, the NEM includes the Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania and Victoria.[26] The NEM is governed by National Electricity Law and namely, the *National Electricity (New South Wales) Act 1997*.[27]

2.2 The structure of the NEM includes parties which generate, transmit, distribute and retail electricity to consumers. Regarding transmission, the network carries power between electricity generators to distributors through assets owned by state governments and private businesses.[28]

2.3 To facilitate the transfer of electricity from generators and to meet the demand of commercial and private consumers, market systems send signals to generators instructing them how much energy to produce every five minutes.[29] This also allows for a contingency in the supply of electricity and moderates the price of electricity.

2.4 Three national agencies exist to provide governance over the NEM, specific to electricity and gas markets. These agencies are:

26 Australian Energy Council, Factsheet: The National Electricity Market (2018, p 1, https://www.energycouncil.com.au/media/12973/national-electricity-market.pdf.

27 New South Wales Government, Department of Planning, Industry and Environment, *NSW Electricity Strategy* (2019), p 2, https://www.energy.nsw.gov.au/sites/default/files/2022-08/2019_11_NSW_ElectricityStrategyDetailed.pdf.

28 Australian Electricity Market Operator, *Fact Sheet: The National Electricity Market* (December 2021), https://www.aemo.com.au/-/media/files/electricity/nem/national-electricity-market-fact-sheet.pdf, p 1.

29 Australian Energy Market Operator, *About the National Electricity Market (NEM)* (2023), https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/about-the-national-electricity-market-nem.

- Australian Energy Market Commission (AEMC) – makes and amends the National Energy Rules under the National Energy Laws[30]
- Australian Energy Regulator (AER) – monitors compliance with the rules specific to gas and electricity markets, energy supply and sale to retail customers[31]
- Australian Energy Market Operator (AEMO) – monitors electricity consumption and the flow of energy across the power system, including adjustments and interventions, where necessary.[32]

2.5 For further information on the governance of the electricity system in New South Wales, refer to chapter one of the report of the prior Standing Committee inquiry.[33]

Electricity generation and transmission in New South Wales

2.6 The New South Wales electricity system, like others both interstate and overseas, is undergoing a considerable transformation, moving away from a reliance on fossil fuels and towards renewable energy sources. This transformation is essential to replace NSW's ageing coal-fired power stations to ensure a reliable supply of affordable energy and achieving the target of zero net emissions by 2050, to which all Australian states and territories have agreed to.[34]

2.7 A fundamental element in the transformation of the state's electricity system is the formation of Renewable Energy Zones (REZs). REZs are areas which contain renewable energy infrastructure, including generators; storage, including batteries and pumped hydro; and high voltage transmission infrastructure. They have been described as the equivalent of modern-day power stations.[35] According to EnergyCo, connecting renewable energy projects and electricity storage will 'deliver cheap, reliable and clean electricity for homes and businesses in NSW'.[36]

2.8 The Energy Corporation of NSW (EnergyCo) is a statutory authority established under the *Electricity Infrastructure Investment Act 2020* and is responsible for leading the delivery of Renewable Energy Zones (REZs) as part of the Government's Electricity Infrastructure Roadmap (the Roadmap). EnergyCo holds the role of 'Infrastructure Planner'[37] in New South Wales and is

30 Australian Energy Market Commission, *Changing the energy rules – a unique process*, https://www.aemc.gov.au/our-work/changing-energy-rules.

31 Australian Energy Regulator, *Our Role*, https://www.aer.gov.au/about/aer/our-role.

32 Australian Energy Market Operator, *Fact Sheet: The National Electricity Market* (December 2021), p 3, https://www.aemo.com.au/-/media/files/electricity/nem/national-electricity-market-fact-sheet.pdf.

33 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 1-2.

34 See ClimateWorks Australia, State and Territory Climate Action: Leading Policies and Programs in Australia (October 2021) p 6.

35 Evidence, Mr Piper, 27 November 2023 p 15.

36 EnergyCo, Renewable Energy Zones (2023), https://www.energyco.nsw.gov.au/renewable-energy-zones.

37 EnergyCo, *NSW Network Infrastructure Strategy* (May 2023), https://www.energyco.nsw.gov.au/sites/default/files/2023-05/network-infrastructure-strategy.pdf p 5.

responsible for assessing and making recommendations to the consumer trustee about REZ network infrastructure projects required for the renewable energy zone.[38]

2.9 The NEM, as with some other electricity systems around the world, aims to decrease its reliance on fossil fuels for electricity generation. Through the *Electricity and Infrastructure Investment Act 2020*, the NSW Parliament has committed to changing the manner in which energy is generated in New South Wales. As part of this strategy, EnergyCo will investigate, plan and coordinate the 'five Renewable Energy Zones and for two priority transmission infrastructure projects (PTIPs, the Waratah Super Battery and the Hunter Transmission Project)'.[39]

2.10 To date, the five REZs that have been declared in New South Wales are:

- the New England Renewable Energy Zone
- the Central-West Orana Renewable Energy Zone
- the Hunter-Central Coast Renewable Energy Zone
- the Illawarra Renewable Energy Zone
- the South West Renewable Energy Zone.

2.11 The REZ areas in New South Wales may be further expanded to include addition renewable energy infrastructure, including batteries, pumped hydro and high voltage electricity transmission infrastructure. The outcome of the REZ areas and PTIP projects is to facilitate the New South Wales energy system to 'halve emissions by 2030 and reach net zero by 2050'.[40]

2.12 In New South Wales, Transgrid owns and operates the electricity transmission system, in accordance with its licence under the *Electricity Supply Act 1995*.[41] Transgrid is responsible for planning, proposing and delivering on ISP projects in New South Wales, with the exception of REZ areas.

2.13 For further information on the transformation of the electricity system in New South Wales, refer to chapter one of the report of the prior Standing Committee inquiry.[42]

Regulatory approvals for energy transmission projects

2.14 The National Energy Rules are developed by the AEMC. These rules can be changed at the request of principal stakeholders including consumers, industry participants and governments.[43] Under clause 5 of the Rules, a regulatory investment test for electricity transmission projects,

38 *Electricity Infrastructure Investment Act 2020*, s 30(1).

39 EnergyCo, *NSW Network Infrastructure Strategy* (May 2023), p.5.

40 EnergyCo, *NSW Network Infrastructure Strategy* (May 2023), p 6.

41 New South Wales Government, Department of Planning Industry and Environment, *NSW Electricity Strategy*, p 6.

42 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 2-6.

43 Australian Energy Market Commission, *About Us*, https://www.aemc.gov.au/about-us.

otherwise known as RIT-T must be performed for certain electricity transmission projects.[44] The proponent bears the responsibility of ensuring a RIT-T test is completed for its energy infrastructure transmission projects and the AER has an obligation as a regulator to ensure that the test is conducted satisfactorily.[45] The purpose of the test is to 'identify the credible option that maximises the present value of the net economic benefit'.[46] Determining the credible option can include an assessment of inputs, costs, estimations, market benefits and valuation approaches, sensitivity and modelling periods.[47]

2.15 In accordance with clause five of the Rules, a RIT-T test must be completed on all projects with a value greater than $5 million.[48]

2.16 While responsibility for conducting the RIT-T test sits with the project proponent, Mr Jim Cox, Deputy Chair of the Australian Energy Regulator (AER), asserted that the AER 'runs a transparency process' where 'the inputs and assumptions are consulted on and it is open for people to dispute them'.[49] In the case of HumeLink, responsibility sits with Transgrid, with the reports from these tests published between 2019 and 2021.[50]

2.17 As discussed in chapter one, wording changes to the National Energy Rules in November 2023 now also require consultation be conducted with a wider range of stakeholders, including local communities.[51] In providing further detail on the change, Mr Jim Cox, Deputy Chair, Australian Energy Regulator said the new wording:

> …requires businesses to engage with stakeholders as part of the preparatory activities who are reasonably expected to be affected by the development of the [project] within a renewable energy zone— this includes local land owners, local council, local community members, local environmental groups and traditional owners.[52]

Concerns regarding the RIT-T process

2.18 This section explores stakeholder concerns around the RIT-T process, including the scope of the test, particularly its perceived failure to adequately address social and environmental costs. Further concerns are addressed, relating to the costs of energy infrastructure projects being

44 Australian Energy Market Commission, National Energy Rules, cl 5.17.1, https://energy-rules.aemc.gov.au/ner/502/320490#5.16.3.

45 Evidence, Mr Jim Cox, Deputy Chair, Australian Energy Regulator (AER), 16 February 2024, pp 5 - 6.

46 Australian Energy Market Commission, National Energy Rules, cl 5.15A.1(c), https://energy-rules.aemc.gov.au/ner/502/320490#5.16.3.

47 Australian Energy Regulator, *Cost benefit analysis guidelines – Guidelines to make the Integrated System Plan actionable* (6 October 2023), pp 60-76, https://www.aer.gov.au/system/files/2023-10/AER%20-%20CBA%20guidelines%20-%20final%20amendments%20%28marked%20up%29%20-%206%20October%202023_0.pdf.

48 Australian Energy Market Commission, National Energy Rules, cl 5.16.3, https://energy-rules.aemc.gov.au/ner/502/320490#5.16.3.

49 Evidence, Mr Cox, 16 February 2024, pp 5-6.

50 Transgrid, *HumeLink*, https://www.Transgrid.com.au/projects-innovation/HumeLink.

51 Evidence, Mr Cox, 16 February 2024 p 4.

52 Evidence, Mr Cox, 16 February 2024 p 5.

passed onto consumers and calls from impacted community members to Transgrid to re-apply the RIT-T test, as a result of material changes to the HumeLink project.

No test for social and environmental costs

2.19 Throughout the inquiry, some stakeholders expressed concerns around the suitability of RIT-T assessment. In particular, community stakeholders and advocacy groups told the committee that the RIT-T assessment criteria are too narrow, in that the test fails to consider the social and environmental costs of a project. It was not clear to the committee whether stakeholders were aware of the review of the RIT-T guidelines that was occurring at the time, and whether these stakeholders thought the changes didn't go far enough.

2.20 Similarly, it was claimed by the HumeLink Alliance Inc that the omission of competition benefits, community and environmental costs from the RIT-T framework, demonstrates that the RIT-T test does not consider the 'overall state benefit.[53] As opposed to a *net benefit*, the Alliance suggested that instead, the environmental costs for the HumeLink project 'only have to be slightly more than $39 million for the project to have a *net cost* to the State'.[54]

2.21 Another purported omission from the RIT-T test was the consideration of indirect costs of landholders. In this regard, NSW Farmers' Association - Upper Lachlan Branch observed that specific to the HumeLink project, indirect costs which are 'imposed on landowners neighboring the easement are not taken into account in the RIT-T'.[55] The Farmers' Association also noted that societal and human impacts, particularly community well-being, mental health, and social cohesion, often remains undervalued or inadequately considered within this framework'.[56]

2.22 Similar views were shared by the ReD4NE Inc, which suggested broadening the elements considered within the RIT-T test to have 'greater respect for the socio-economic and environmental implications on host communities'.[57]

2.23 Ms Amy Kean, Managing Director, Stride Renewables, expressed the view that reform to the RIT-T test is required, in order to allow it to consider social costs and license within impacted communities:

> I think the RIT-T process has some fundamental challenges associated with it. It is very much focused on the least cost, which you raised before, and doesn't consider the environmental or social impact. I think there should be consideration as to how that can be more fit for purpose, and I understand the AER is doing a review of that at the moment. But, obviously, in New South Wales, a lot of the transmission lines that have been proposed are not under that framework. That is why the renewable energy zones don't consider the importance of social licence. I commend the policy to have benefit-sharing programs as part of that, but, yes, there is absolutely room for reform of the current RIT-T process.[58]

53 Submission 12, HumeLink Alliance Inc, p 7.

54 Submission 12, HumeLink Alliance Inc, p 7.

55 Submission 36, NSW Farmers' Association – Upper Lachlan Branch, p 2.

56 Submission 36, NSW Farmers' Association – Upper Lachlan Branch, p 2.

57 Submission 73, ReD4NE Inc, p 6.

58 Evidence, Ms Kean, 27 November 2023, p 22.

2.24 Changes to the RIT-T test were also supported by Mr Simon Corbell, CEO and Chairperson, Clean Investor Energy Group, who advocated for the RIT-T to include 'stronger regard to community impacts and broader non-economic considerations'.[59]

2.25 In contrast, the objects of the *Electricity Infrastructure Investment Act 2020* explicitly include 'to foster local community support for investment in new generation, storage, network and related infrastructure'.[60]

2.26 As an example of the alternative types of regulatory tests currently in use in other jurisdictions, ReD4NE Inc explained that energy transmission industries in Europe are moving away from narrow technical assessments to a 'broader review which takes account of a more comprehensive insight of…environmental considerations', although no specific examples were provided.[61]

2.27 Both Ms Kean and Mr Corbell acknowledged that at the time of the first hearing, the AER was conducting a review into the broader criteria within the RIT-T test[62]. These changes are noted within chapter one of this report.

2.28 However, Mr Da Silva Alvarez of Iberdrola noted in evidence that 'the regulatory framework for the UK… is based on less cost for consumers'.[63]

Financial costs borne by the consumer

2.29 Stakeholders also criticised the tendency of the RIT-T test to favour projects of least cost. For example, Mr Les Brand, Managing Director, Amplitude Consultants, stated that the RIT-T process tends to favour the project option that has the higher net market benefit, which is 'usually…the lowest cost option'.[64] Ms Kean also supported the view, stating that 'the RIT-T process has some fundamental challenges associated with it. It is very much focused on the least cost'.[65]

2.30 Evidence from electricity consumer advocates, however, noted the importance of minimising the costs of electricity infrastructure. For example, the Energy Users' Association of Australia noted in its submission that the costs of transmission infrastructure on consumer bills 'flows through the whole economies value chains to goods and services and ultimately the cost of living for householders'.[66]

2.31 Similarly, Mr Adams of Energy Networks Australia noted:

> I think we saw it flow through with the most recent cost-of-living crisis. It started with what was going on in Ukraine and it started with gas shortages, and that pushed up

59 Evidence, Mr Corbell, CEO and Chairperson, Clean Energy Investor Group, 27 November 2023, p 22.

60 Answers to questions on notice, EnergyCo, 6 March 2024, p 1.

61 Submission 73, ReD4NE, p 2.

62 Evidence, Mr Corbell and Ms Kean, 27 November 2023, p 22.

63 Evidence, Mr Ricardo da Silva Alvarez, Business Development manager, Iberdrola Australia, 16 February 2024, p 29.

64 Evidence, Mr Brand, 27 November 2023, p 10.

65 Evidence, Ms Kean, 27 November 2023, p 22.

66 Submission 29, Energy Users' Association of Australia, p 1.

> wholesale prices domestically here with our gas markets that are linked internationally. And that flows through to everything—the cost of steel and the cost of all sorts of goods and services. It's not just your energy bill that goes up; everything goes up… Energy is one of the core planks of our whole economy.[67]

2.32 Mr Corbell also explained the importance of how the regulatory test seeks to minimise costs to electricity consumers:

> In general, the way that this regulatory environment operates is that, first of all, it is a recognition that transmission is a natural monopoly and, therefore, the owner of those assets is able to seek costs for the development of that infrastructure from all of the consumers who benefit from it. As a result, the Australian Energy Regulator has to have regard to minimising cost impacts for consumers, because this is a monopoly asset with a regulated asset base, and that transmission owner, the monopoly operator, can only seek to recover its costs from consumers where it is the most cost-efficient piece of infrastructure to recover costs from. Basically, transmission infrastructure operators are not allowed to build expensive pieces of kit that are not the cheapest, most suitable solution and then ask consumers to pay for it through their electricity bills.[68]

2.33 When asked directly about the existing regulatory framework and the impacts of costs to consumers, Mr Corbell expressed the view:

> … energy transition is expensive and in the Australian regulatory environment those costs are largely passed through to consumers, particularly when it comes to infrastructure such as transmission and, therefore, the broader costs borne by consumers—big and small, households and businesses [and] must be properly taken into account.[69]

2.34 The first inquiry heard similar views on the strong focus of costs of transmission projects, given the costs are ultimately passed on to the consumer. Refer to chapter three for further views, which were noted within the inquiry.[70]

Calls to reconduct the RIT-T test due to changes in HumeLink project

2.35 Noting all of these concerns, the HumeLink Alliance Inc argued that that the RIT-T should be reapplied to the HumeLink project, due to the material changes which had occurred within the project, including a significant increase in project costs, a reduction in the electrical capacity of the proposed infrastructure, project delays to Snowy Hydro 2.0 and changes to assumptions about generators.[71] In evidence to the first inquiry, the Alliance stated that Snowy 2.0 was delayed by four and a half years, with completion due in December 2029.[72]

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67 Evidence, Mr Dominic Adams, General Manager – Networks, Energy Networks Australia, p 28.

68 Evidence, Mr Corbell, 27 November 2023, p 24.

69 Evidence, Mr Corbell, 27 November 2023, p 22.

70 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 45-49.

71 Submission 12, HumeLink Alliance Inc, p 3.

72 Submission 106 (First inquiry), HumeLink Alliance Inc, p. 3

2.36 This sentiment was shared by Mr Michael Katz of the Stop, Rethink HumeLink group who asserted that the RIT-T test should be reapplied to the HumeLink project, as a result of the material changes to the project.[73]

2.37 Further, Mr Bill Kingwill, from the HumeLink Action group told the committee that their group had requested for the 'reapplication of the RIT-T, regulatory investment test for transmission to the HumeLink project'.[74]

2.38 At the second hearing, the committee was informed by Mr Cox, of the AER, that the AER was assessing a 'contingent application' for HumeLink from Transgrid.[75] While he said he could not comment on the extent to which the contingent application was different as he had not personally reviewed it, Mr Cox agreed that it was likely that the application would include an acknowledgement from Transgrid that the project costs had increased.[76] As to whether the RIT-T test needed to be re-run as a consequence, Mr Cox responded that this decision sat with Transgrid, who were required to reassess whether a 'material change in circumstances' had occurred.[77] As noted in chapter one, this was in response to changes made by the AER to its cost benefit analysis guidelines.[78]

Environmental approvals for energy transmission projects

2.39 As discussed in chapter one, the completion of an environmental impact statement (EIS) is required to assess a project's viability, incorporating economic, environmental and social factors.[79] The Planning Secretary's environmental assessment requirements (SEARs) establish the outcomes to be assessed through the EIS process.[80] These requirements can typically include a variety of assessments for energy transmission infrastructure projects, not limited to:

- statutory context, capital investment, employment and electricity system security and reliability
- environmental heritage, Aboriginal cultural heritage, water, biodiversity, buskfire risk, landscape and visual impact, land, site selection and strategic context and climate change risk

73 Submission 54, Mr Michael Katz, Stop, Rethink HumeLink Campaign, p 6.

74 Submission 77, Mr Bill Kingsmill, HumeLink Action Group, p 2.

75 Evidence, Mr Cox, 16 February 2024, p 3.

76 Evidence, Mr Cox, 16 February 2024, p 3.

77 Evidence, Mr Cox, 16 February 2024, p 3.

78 Australian Energy Regulator, *Cost benefit analysis guidelines – Guidelines to make the Integrated System Plan actionable* (6 October 2023), https://www.aer.gov.au/system/files/2023-10/AER%20-%20CBA%20guidelines%20-%20final%20amendments%20%28marked%20up%29%20-%206%20October%202023_0.pdf.

79 NSW Government, Department of Planning, *State Significant Infrastructure Guidelines – preparing an environmental impact statement* (July 2022), p 6, https://www.planning.nsw.gov.au/sites/default/files/2023-03/state-significant-infrastructure-guidelines.pdf.

80 NSW Government, Department of Planning, *State Significant Infrastructure Guidelines – preparing an environmental impact statement* (July 2022), p 12.

- hazards and risks, traffic, transport and accessibility, waste management, noise vibration, glint and glare and contamination and remediation
- social impact, engagement and economic impact and voluntary benefit sharing.[81]

2.40 Both the HumeLink and Central-West Orana renewable energy zone (REZ) projects were declared as Critical State Significant Infrastructure (CSSI). Both projects were also required to obtain Commonwealth Government approval in accordance with its *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

Stakeholder views on the HumeLink and Central West-Orana Renewable Energy Zone environmental approvals

2.41 This section introduces concerns raised by community members, including the fact that land acquisitions have already occurred, prior to the final approval of the Central-West Orana REZ EIS assessment. Additional concerns are explored including the accuracy of the EIS process itself and community sentiment about feedback relating to the Central-West Orana REZ project.

Land acquisitions occurring prior to environmental approval in Central-West Orana

2.42 A number of landowners expressed disappointment with the fact that the compulsory acquisition of land had already commenced for the Central West Orana REZ, notwithstanding the EIS not being finalised (see 1.10). For example, Mr Grant Piper, Chair of the Uarbry Tongy Lane Alliance and the National Rational Energy Network asserted that the consultation had not been appropriate, given that landholder acquisition discussions had already commenced between EnergyCo and freehold landowners within the Central-West Orana region, despite the EIS process still being underway.[82]

2.43 Adding to his evidence, Mr Piper described EnergyCo representatives attempting to obtain access to properties where proposed easements may be located, suggesting there was a sense of 'desperation' that was leading to the acquisition process to be rushed.[83]

2.44 This view was shared by another impacted landowner, who confirmed that acquisitions had commenced and that their request for an extension to allow time for them obtain an evaluation report prior to negotiation of acquisition 'has been denied'.[84]

2.45 In this landowner's opinion, 'Energy Co [sic] are attempting to force us to sign'.[85] Other individuals shared similar experiences, with one person describing themselves as being in contact with other landholders who have also said no real "negotiation" has occurred.[86]

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81 NSW Government, Department of Planning, *Planning Secretary's Environmental Assessment Requirements* (September 2023), pp 1–6, https://www.planning.nsw.gov.au/sites/default/files/2023-03/sears-large-scale-solar-energy.pdf

82 Evidence, Mr Piper, 27 November 2023, pp 13-14.

83 Evidence, Mr Piper, 27 November 2023, p 15.

84 Submission 78, Name suppressed, p 1.

85 Submission 78, Name suppressed, p 1.

86 Submission 78, Name suppressed, p 1.

2.46 Mr James Hay, Chief Executive Officer, EnergyCo, made clear that EnergyCo does not endorse any poor landholder treatment or threats made to landholders, in negotiating compulsory acquisitions.[87] Mr Hay also emphasised that all parts of the negotiation process are conducted in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.[88]

Issues with the environmental impact assessment process

2.47 The committee also received evidence that the use of biodiversity offsets to mitigate the environmental effect of the project was inappropriate, and also significantly costly. Further concerns were also noted relating to transportation infrastructure, such as the construction of roads to support the development of the HumeLink and Central-West Orana REZ projects.

2.48 For example, Ms Shana Neremberg, a community member and a former consultant botanist with exposure to environmental impact assessments, expressed concerns about the large proportion of the project costs required for biodiversity offsets.[89] Ms Neremberg also argued that half a page in the HumeLink EIS main report was not sufficient to explain how the biodiversity offsets would be spent.[90]

2.49 Other stakeholders thought the traffic assessment component of the EIS contained inadequacies. For example, an impacted landowner expressed concerns on the accuracy of figures within the Traffic and Transportation Impact Assessment, which forms part of the EIS.[91] In the evidence provided relating to access roads, this stakeholder claimed that many 'are narrow dirt roads, others rough forestry tracks, others are little more than wheel tracks in the grass'.[92]

2.50 Broader concerns with the environmental impacts of both overgrounding and undergrounding are discussed further at 3.107.

Hearing community feedback and concerns

2.51 Stakeholders also expressed concern relating to the inadequacy of community consultation during the EIS process throughout the Central-West Orana REZ project. These community members expressed the view that the community engagement was ineffective in addressing community concerns. Many stakeholders asserted that community consultation throughout the project. was not of an adequate standard.

2.52 Mrs Sally Edwards, a community representative and Community Development Coordinator from the Warrumbungle region, highlighted that the Central-West Orana REZ project EIS report confirmed its commitment to the Quality Assurance Standard: For Community and Stakeholder Engagement (the Quality Assurance Standard).[93] As Mrs Edwards explained, this required that the EIS process include 'effective community participation'. Whilst Mrs Edwards

87 Evidence, Mr James Hay, Chief Executive Officer, EnergyCo, 27 November 2023, p 32.

88 Evidence, Mr Hay, 27 November 2023, p 32.

89 Submission 61, Ms Shana Neremberg, p 2.

90 Submission 61, Ms Neremberg, p 2.

91 Submission 50, Name suppressed, p 5.

92 Submission 50, Name suppressed, p 5.

93 Submission 23, Mrs Sally Edwards, Volunteer Community Representative – Warrumbungle Region EnergyCo REZ Community Reference Group, p 3.

acknowledged that communities impacted by the Central-West Orana REZ project were engaged, she did not believe the process offered the public the ability to be '"involved" or to "collaborate" in an effort to "empower" the impacted communities'.[94]

2.53 CWO REZist Inc, a community group opposed to the development of the Central-West Orana REZ project, also suggested that the engagement from EnergyCo prior to the commencement of the project was inadequate:

> … we are told from our various members from across the CWO REZ, was purely Energy Co [sic] relating what will be happening, but does not show an honest attempt at understanding and addressing people's concerns in a real way.[95]

2.54 Mr James Hay, Chief Executive Officer, EnergyCo was asked about this issue at the hearing. He disputed that the consultation and engagement can been inadequate, stating instead that the approach was tailored to each specific community:

> We look at each community as we find it. We look at the landowners as we find them. We look at the electricity needs and the anticipated demand and use of electricity over time and how it serves affordability, reliability and sustainability for the community over time.[96]

2.55 However. Mr Hay also added that in relation to community support, EnergyCo was both learning from experiences and improving.[97] Further, Mr Hay noted EnergyCo's requirement to foster local community support, as a requirement of the *Electricity Infrastructure Investment Act*.[98]

2.56 Refer to chapter three of the prior Standing Committee inquiry report for further evidence regarding engagement and consultation with the community relating to the Central-West Orana REZ project.[99]

Committee comment

2.57 The committee notes concerns that the RIT-T criteria are too narrow and that they fail to incorporate both social and environmental costs. In addition, we acknowledge that some stakeholders believe the RIT-T places too greater weighting on the overall cost of electricity transmission project, at the expense of non-economic factors. We also acknowledge that during the time of this inquiry, the National Energy Rules and RIT-T framework were changed to consider social impacts.

2.58 The committee also believes that the requirement for consumers to pay for transmission infrastructure in the National Energy Rules needs to be revisited, given the scale of transmission upgrades needed as a result of the switch to renewable energy.

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94 Submission 23, Mrs Edwards, p 8.

95 Submission 27, CWO REZist Inc, p 10.

96 Evidence, Mr Hay, 27 November 2023, p 34.

97 Evidence, Mr Hay, 16 February 2024, p 35.

98 Evidence, Mr Hay, 16 February 2024, p 35.

99 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), p 42.

2.59 While we are heartened by these changes and their attempt to include broader factors in the regulatory assessment of projects, it is arguable that the absence of these non-economic factors in the original RIT-T test as applied to the HumeLink projectpartially facilitated the approval of a project which did not give sufficient weight to social and environmental factors. The committee sought to understand whether material changes to the HumeLink project have resulted in Transgrid re-performing the RIT-T test. However, we found there is a lack of transparency pertaining to whether material changes to the HumeLink project, including cost, have resulted in Transgrid re-performing the required RIT-T test, in accordance with changes to the Australian Energy Regulator's guidelines.

2.60 We also accept that there is still a failure to consider broader environmental elements within the National Electricity Rules and RIT-T process for major electricity transmission and distribution projects. To fill this gap, we recommend that the 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.

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.

2.61 It is also clear to the committee that the environmental consultation undertaken as part of the HumeLink and Central West Orana REZ projects has left many impacted communities frustrated. The committee heard evidence of inadequate community consultation practices during the environmental impact statement process, including failed opportunities to seek community feedback. It was clear to us that there is a need for EnergyCo and electricity transmission providers such as Transgrid, to improve consultation within communities when performing environmental impact assessments.

Finding 1

There is a need for EnergyCo and electricity transmission providers such as Transgrid, to improve consultation within communities when performing environmental impact assessments.

2.62 We were also concerned to hear that the environmental impact statements for both these projects may not have had sufficient information to allow for consideration of all required project impacts and potential risks. The committee acknowledges concerns regarding the adequacy of biodiversity offsets and the potential impacts of planned construction roads.

2.63 In this context, the committee is aware that for relevant guidelines require the Department of Planning to promote issues raised by the community in its assessment of projects. However, it is possible that more could be done in this area. Therefore, to ensure effective and genuine community consultation and engagement takes place for major energy projects, the committee

is of the view that the relevant guidelines should be amended to require early, genuine and ongoing community engagement in the preparation of an environmental impact statement.

Recommendation 2

That the Department of Planning consider further amending the relevant guidelines to require early, genuine and ongoing community engagement in the preparation of an environmental impact statement.

Chapter 3 Costs, benefits and risks impacting energy transmission

This chapter explores the costs, design and approach and risks impacting current and future energy transmission in New South Wales. It begins by outlining the disputed costs of undergrounding versus overhead transmission lines for electricity infrastructure, before exploring the viability of a 'hybrid' approach to electricity transmission infrastructure.

The second part of the chapter examines the broader considerations of undergrounding transmission lines and traditional overhead lines, including key concerns raised in relation to bushfire risks, impacts to cultural heritage and the environment. This chapter then highlights the importance of social licence for projects such as the HumeLink and Central-West-Orana REZ. It concludes with an exploration of stakeholder views on these projects' impacts on landholders and broader communities and the quality of community engagement throughout the assessment and planning processes.

Disputes on costs, design and approach to the HumeLink energy transmission infrastructure

3.1 Throughout this inquiry, there were a variety of opinions relating to the costs, selection of the type of current for high voltage transmission, the overall design impacts and timing of the HumeLink project.

Disputed costs of undergrounding the HumeLink project

3.2 As noted in chapter two of the State Development inquiry report ('the first inquiry report')[100], in response to community concerns, in late 2021, Transgrid commissioned an independent report from GHD into the feasibility of undergrounding the HumeLink project, entitled *'Concept Design and Cost Estimate HumeLink Project – Underground'* (GHD report).[101]

3.3 This report was released in August 2022.[102] The GHD report found that the capital expense (CAPEX) cost of undergrounding HumeLink using a high-voltage direct current (HVDC) transmission lines would be $11.5 billion and that undergrounding using a high voltage alternating current (HVAC) transmission lines would cost $17.1 billion.[103]

3.4 In contrast, the previous committee heard that the estimated cost of completing the HumeLink project using overhead lines was $3.3 billion. In questioning from the previous committee in

100 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 11-20.

101 P 11.

102 Submission 30, Specialist Utility Infrastructure, Attachment A, GHD, Concept Design and Cost Estimate: HumeLink Project – Underground (22 August 2022), p i.

103 Submission 30, Specialist Utility Infrastructure, Attachment A, GHD, Concept Design and Cost Estimate: HumeLink Project – Underground (22 August 2022), p vi.

July 2023, Mr Brett Redman, Chief Executive Officer, Transgrid, confirmed that the cost of the project had increased to 'about $5 billion'.[104]

3.5 These costs were disputed in an October 2023 reported prepared by Amplitude Consultants entitled '*HumeLink Undergrounding – Review of the Transgrid Report and Costing of HVDC Alternatives*' (Amplitude report).[105] This report identified a 'number of concerns' with the GHD report, including its costing of the HVAC and HVDC undergrounding options, the schedule of these projects, as well as the 'general unbalanced way in which the undergrounding options are compared qualitatively to the AC overhead option'.[106]

3.6 The Amplitude report did not contain estimated costings for the construction of the HumeLink using HVAC transmission lines. However, the report noted that the estimated CAPEX for the project would be:

- using option 2A-1 (100% HVDC transmission lines undergrounded) from the GHD report $7.3 billion,[107] and
- using option 1C (direct point to point HVDC connection between Maragle and Bannaby using HVDC underground transmission lines) from the GHD report, $5.46 billion.[108]

3.7 One of the report's authors, Mr Les Brand, Managing Director, Amplitude Consultants, was questioned by the committee about the costings contained within both the GHD and Amplitude reports. Mr Brand stressed that the undergrounding costings presented within the Amplitude report were a worst-case construction scenario, using a cut-and-lay method, which is a slower construction approach.[109] When questioned about a potential for an overstatement of operating costs within the GHD report, Mr Brand remarked that the figures were 'extraordinarily high'.[110] In defence of option 2A-1, Transgrid stated that the 1928MWI capacity cited by Amplitude consultants was 'significantly less than the 2,570MW provided by GHD's option'.[111]

104 Evidence, Mr Brett Radman, Chief Executive Officer Transgrid, 20 July 2023, https://parliament.nsw.gov.au/lcdocs/transcripts/3105/Transcript%20-%2018%20July%202023%20-%20CORRECTED.pdf, p 29.

105 Submission 30, Specialist Utility Infrastructure, Attachment B, Amplitude Consultants, *HumeLink Undergrounding – Review of the Transgrid Report and Costing of HVDC Alternatives* (3 October 2023), p iv.

106 Submission 30, Specialist Utility Infrastructure, Attachment B, Amplitude Consultants, *HumeLink Undergrounding – Review of the Transgrid Report and Costing of HVDC Alternatives* (3 October 2023), p iv.

107 Submission 30, Specialist Utility Infrastructure, Attachment B, Amplitude Consultants, *HumeLink Undergrounding – Review of the Transgrid Report and Costing of HVDC Alternatives* (3 October 2023), p iv.

108 Submission 30, Specialist Utility Infrastructure, Attachment B, Amplitude Consultants, *HumeLink Undergrounding – Review of the Transgrid Report and Costing of HVDC Alternatives* (3 October 2023), p iv.

109 Evidence, Mr Brand, 27 November 2023, p 3.

110 Evidence, Mr Brand, 27 November 2023, p 5.

111 Email from Ms Emma Ashton, Senior Manager Government and Stakeholder Relations, Transgrid, to Chair, 15 December 2023.

Views on the increased costs of undergrounding

3.8 While there was general consensus that the costs associated with undergrounding electricity transmission infrastructure are higher, there was a range of views as to exactly how much. For example, Mr Simon Corbell, Chair and Chief Executive Officer, Clean Energy Investor Group, highlighted that similar HVDC transmission projects in Victoria indicated that 'the cost of undergrounding high-voltage transmission lines is up to double the cost associated with overhead transmission infrastructure'.[112]

3.9 Mr Andrew Kingsmill, Executive Director, Network Planning and Technical Advisory, EnergyCo also agreed that underground infrastructure is more expensive, but suggested the cost could be between three and ten times greater:

> 'Most of our information on that comes from publicly available reports that we've researched. We would be saying in the order of three to 10 times. I'm aware that there are estimates that have been prepared that have been slightly less than that'.[113]

3.10 Evidence presented to the committee by Ausgrid was that underground infrastructure can be five to six times the cost of overhead options but can vary between projects.[114]

3.11 Associate Professor Roger Dargaville, Interim Director, Monash Energy Institute, suggested that the cost of undergrounding the transmission infrastructure would be four to 10 times the cost of overhead infrastructure.[115] He also added that AC-DC converters, most commonly used in conjunction with undergrounded transmission lines, are expensive and that 'the economics would not stack up' to use converters for short distances of lines, just to 'divert around a particular community'.[116]

3.12 Mr Les Brand told the committee that 'if you throw a whole lot of other things in there, [the cost] maybe two times, but, yes, it is not 10 times'.[117] According to Mr Brand, this ten-fold estimate is based on the assumption of undergrounding using AC transmission lines, and by considering the use of HVDC transmission lines underground 'you can get those numbers down… as low as 1.5 times'.[118]

3.13 However, other evidence suggested that Mr Brand's solution of using HVDC transmission lines would not be feasible in the context of the transmission required in NSW and that it was very expensive. For example, this was pointed out in the Energy Corporation of NSW's submission.[119] Associate Professor Roger Dargaville of the Monash Energy Institute also noted:

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112 Evidence, Mr Corbell, 27 November 2023, p 18.

113 Evidence, Mr Andrew Kingsmill, Executive Director, Network Planning and Technical Advisory, EnergyCo, 27 November 2023, p 40.

114 Submission 26, Ausgrid, 10 November 2023, p 1.

115 Evidence, Associate Professor Roger Dargaville, Interim Director, Monash Energy Institute, 16 February 2024, p 17.

116 Evidence, Associate Professor Dargaville, 16 February 2024, p 17.

117 Evidence, Mr Brand, 27 November 2023, p 7.

118 Evidence, Mr Brand, 27 November 2023, p 7.

119 Submission 35, Energy Corporation of NSW, p 7.

> I think the issue here is that the expense of converting from AC to DC and back again for relatively short trunks of transmission would be prohibitively expensive. You normally only do DC above ground or below ground for stretches of hundreds of kilometres. The AC-DC converters are very, very expensive. If you were just doing it to do tens of kilometres to maybe divert around a particular community, the economics would not stack up.[120]

Viability of using HVDC transmission lines in undergrounding

3.14 Other witnesses were less supportive of the idea that HVDC transmission lines provided a viable cost-equivalent alternative to the predominantly used AC transmission lines. For example, in answers to questions on notice, EnergyCo advised that until the last few decades, technology was not developed enough to transform the voltage of DC (direct current) electricity.[121] Furthermore, they noted that the current technology for HVDC is both complex and expensive:

> HVDC technology requires complex power electronics at both ends of every line to convert the power between AC and DC. In addition to being complex and expensive, these converter stations do not readily allow 'cut-ins' to connect future generators, do not allow practicably for meshed network configurations such as in Renewable Energy Zones (REZs) and are uneconomic in networks with large numbers of short connections.[122]

3.15 In contrast, EnergyCo confirmed that AC technology has been used historically as it allows for voltages to be changed at a low cost and new HVAC lines can also be easily integrated into the existing network at a lower cost. [123] EnergyCo also said that AC allows voltages to be used across long distances with low energy loss. [124]

3.16 On the related matter of the required AC-DC converters, both Mr Junayd Hollis, Group Executive – Customer, Assets and Digital, Ausgrid and Associate Professor Dargaville shared the view that AC converters are expensive, highlighting this impacts the cost of selecting DC transmission infrastructure.[125]

The flow-on effect of costs on consumers

3.17 Stakeholders at both inquiries, such as EnergyCo, Australian Energy Regulator (AER) and Energy Networks Australia, emphasised that it was important to consider the cost to consumers down the line as part of the overall assessment of project costs.[126]

3.18 At the first inquiry, Mr Brett Radmann, CEO of Transgrid told the committee that the effect of a project on consumer costs was a key consideration:

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120 Evidence, Associate Professor Dargaville, 16 February 2024, p 1

121 Answers to question on notice, EnergyCo, 9 January 2024, p 2.

122 Answers to question on notice, EnergyCo, 9 January 2024, p 2.

123 Answers to question on notice, EnergyCo, 9 January 2024, p 2.

124 Answers to question on notice, EnergyCo, 9 January 2024, p 2.

125 Evidence, Mr Junayd Hollis, Group Executive – Customer, Assets and Digital, Ausgrid, 16 February 2024, p 42 and Associate Professor Dargaville, 16 February 2024, p 17.

126 Evidence, Mr Hay, 16 February 2024, p 35, Evidence Mr Cox, 16 February 2023, p 2, Evidence, Mr Dominic Adams, General Manager – Networks, Energy Networks Australia, 16 February 2024, p 26.

> The AER must be satisfied that the total investment is both prudent and efficient in terms of the cost to deliver the project because it has a direct impact on customer bills. The AER would not accept the cost of undergrounding HumeLink because it would result in an unacceptable increase in the project cost of three to 10 times.[127]

3.19 Similarly, Ms Marie Jordan, Executive General Manager, Transgrid asserted that the potential savings for consumers from a certain method of transmission were important for any proponent to consider:

> Personally, I think the cost to consumers has a huge impact, because you look at the demographics across New South Wales where a small saving can be a big difference to some of the people impacted by the cost of electricity today.[128]

3.20 At this inquiry, Mr Corbell of the Clean Energy Investor Group said that overhead transmission was 'more cost effective and that means consumers pay less when it comes to their electricity bills'.[129]

3.21 The Energy User's Association of Australia also emphasised their concerns around the cost impacts of undergrounding on consumers, arguing that 'householders will be paying the increased cost for undergrounding through their electricity bills, and through the increased price of everyday items produced in NSW'.[130]

3.22 However, Energy Networks Australia (ENA) suggested that the preferred electricity transmission design option should be solely dependent on the least cost option and that the net benefit for collective electricity consumers considers 'price, reliability and system security and achievement of emissions targets'.[131]

3.23 The first inquiry also heard concerns in relation to both the cost of electricity infrastructure being passed onto consumers and the RIT-T process itself. Refer to chapter three of the first inquiry report for further evidence noted.[132]

3.24 Hypothesizing on why AC overhead transmission might have been the supported option for HumeLink, Mr Brand thought that it was because it would pass the current regulatory processes, including the cost benefit analysis performed as a part of the RIT-T.[133] In this context, Mr Brand added that this analysis favours 'the cheapest solution, and that is pretty much what the current processes are set up for'.[134]

3.25 When asked about the difference between HVAC and HVDC infrastructure and why the former was the intended technology for REZ projects, Mr Andrew Kingsmill from EnergyCo explained that AC is 'how most of the power systems operate today', with the exception of the DC

127 Evidence, Mr Brett Radmann, Chief Executive Officer, Transgrid, 18 July 2023, p 26.

128 Evidence, Ms Marie Jordan, Executive General Manager, Transgrid, 7 August 2023, p 20.

129 Evidence, Mr Corbell, 27 November 2023, p 18.

130 Submission 29, Energy Users' Association of Australia, 10 November 2023, p 1.

131 Submission 34, Energy Networks Australia, p 6.

132 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 44-50.

133 Evidence, Mr Brand, 27 November 2023, p 5.

134 Evidence, Mr Brand, 27 November 2023, p 5.

interconnectors between states.[135] Mr Kingsmill illustrated that HVAC is generally used due to rotating machines naturally generating AC power, with historically used generators such as coal-fired generators and hydro generators being rotating machines.[136]

Duration and design of the HumeLink project – overhead or underground transmission lines

3.26 The timeframes required to complete the HumeLink project with either overhead lines or underground transmission lines were also a focus of the inquiry. At the start of the inquiry the committee noted that the estimated timeframe for the completion of overgrounding of the HumeLink project was 2026-2027.[137]

3.27 When directly questioned about timeframes to complete the HumeLink project using underground transmission lines, Mr Brand acknowledged the timeframe of four to five years to complete the project from today.[138] Mr Brand informed the committee that this was due to the project being required to almost start again, due to the stage of the current project.[139]

3.28 In the case of option 2A-1 as cited within the GHD report, the approximate timeline was seven years to complete the underground HVDC option.[140] No estimate was provided for option 1C, as described above. However, Mr Brand sought to assert to the committee that 'if you assess it fairly and decide to go HVDC underground, then HVDC underground will be built before the AC overhead line'.[141]

3.29 In response to the Amplitude report, Transgrid stated that a fully undergrounded solution was ruled out based, in part, on the critical risk of subsequent project delays.[142]

The importance of not delaying the shift to renewable energy

3.30 While stakeholders had differing views about the technology best suited to do this, there was broad agreement that it was crucial that transmission lines be constructed in time to support the rapid expansion of renewable energy projects. Many witnesses emphasised that energy generation in New South Wales is set to undergo a massive transition towards renewable sources, and the need for appropriate and timely technology was crucial.

3.31 In this regard, the committee heard that there are a number of State and Commonwealth Government strategies which will continue to drive the NEM in the direction of renewable energy initiatives, including the:

135 Evidence, Mr Kingsmill, 27 November 2023, p 41.

136 Evidence, Mr Kingsmill, 27 November 2023, p 41.

137 Submission 30, Specialist Utility Infrastructure, Attachment A, GHD, Concept Design and Cost Estimate: HumeLink Project – Underground (22 August 2022), p 1.

138 Evidence, Mr Brand, 27 November 2023, p 6.

139 Evidence, Mr Brand, 27 November 2023, p 6.

140 GHD, Concept Design and Cost Estimate: HumeLink Project – Underground (22 August 2022), p vi.

141 Evidence, Mr Brand, 27 November 2023, p 6.

142 Email from Ms Ashton, Transgrid, to Chair, 15 December 2023.

- NSW Electricity Strategy[143]
- NSW Electricity Infrastructure Roadmap[144]
- Net Zero Plan Stage 1: 2020-2030[145]
- NSW Climate Change Policy Framework[146]
- Capacity Investment Scheme.[147]

3.32 It was noted by witnesses that large-scale change will be made across the NEM to support the change to renewable energy sources and the move away from coal-fired electricity.[148]

3.33 Ms Jordan, Executive General Manager – Networks, Transgrid, informed the committee that Transgrid is supportive of both State and Commonwealth government strategies to cut domestic carbon emissions to net zero and that Transgrid had committed to 82 per cent of energy from the grid being derived from renewable energy sources by 2030.[149]

3.34 Ms Jordan explained Trangrid's approach to meet the abovementioned commitment, including the decommissioning of end-of-life coal-fired power stations, except for Mount Piper, by 2033.[150] In this context, Ms Jordan stressed that Transgrid must 'ensure transmission lines are built to connect renewable energy projects to the grid to get cheap, clean electricity from generation sources [to] where it is most needed'.[151]

3.35 Mr Brand agreed that in the transition to renewable energy sources, a significant amount of high voltage transmission would be required to connect remote renewable energy sources to demand centres, being where the electricity is required.[152] Mr Corbell agreed that there is a need to generate as much clean energy in the National Electricity Market as quickly as possible. Acknowledging the pace required for energy transition to renewable sources, Mr Corbell stressed the view that, 'building infrastructure that will take longer to deliver, that will be less long-lived and will be more expensive just doesn't make sense'.[153] In his view, the quickest way to achieve this transition is with overhead transmission cabling.[154]

3.36 In his evidence, Associate Professor Roger Dargaville, Interim Director, Monash Energy Institute, said that all of the modelling conducted by his team assumed that either method of transmission – overgrounding or undergrounding – would allow the achievement of net zero

143 Evidence, Mr Hay, 27 November 2023, p 34.

144 Evidence, Mr Hay, 27 November 2023, p 35.

145 Evidence, Ms Kean, 27 November 2023, p 20.

146 Evidence, Ms Jordan, 16 February 2024, p 50.

147 Evidence, Ms Jordan, 16 February 2024, p 50.

148 Evidence, Mr Hay, 27 November 2023, p 33 and Evidence, Mr Woulfe, 27 November 2023, p 27.

149 Evidence, Ms Marie Jordan, Executive General Manager – Network, Transgrid, 16 February 2024, p 50.

150 Evidence, Ms Jordan, 16 February 2024, p 50.

151 Evidence, Ms Jordan, 16 February 2024, p 50.

152 Evidence, Mr Brand, 27 November 2023, p 2.

153 Evidence, Mr Corbell, 27 November 2023, p 22.

154 Evidence, Mr Corbell, 27 November 2023, p 18.

by 2050. What differed was the increase in cost, which he estimated would be approximately 20 to 30 per cent higher for undergrounding.[155]

3.37 For further discussion of the need to promptly build renewable energy infrastructure in response to climate change, see 3.64.

The viability of a 'hybrid' approach

3.38 The committee sought to understand whether a hybrid approach; that is, where transmission infrastructure is placed both underground and overhead, would be a viable solution to many of the issues raised by stakeholders, including those relating to cost, timing, environmental impacts and impacts on landholders.

3.39 For example, in describing the case of an effective community consultation approach, Mr Hollis informed the committee of a hybrid part-overhead line and undergrounded project in Wamberal.[156] Mr Hollis explained that the design of the project was changed to incorporate four kilometres of underground transmission lines, in response to community feedback.[157]

3.40 Others referred to a lack of modelling on a hybrid approach. When asked about how a hybrid model might work, Associate Professor Dargaville from Monash University suggested that 'converting from AC to DC and back again for relatively short trunks of transmission would be prohibitively expensive, and that the most viable way of creating a hybrid model would be to put AC underground transmission lines 'for short sections'.[158] Mr Dargaville also explained that the university did not 'have the resources to run lots and lots of hybrid simulations of mixes above and below ground at this stage'.[159] In the context of underground HVAC transmission lines, Associate Professor Dargaville confirmed that this could be a viable hybrid approach to transmission infrastructure over short periods.[160]

3.41 Whilst some stakeholders did not engage directly with the idea of a hybrid approach of constructing electrical infrastructure, there was a general consensus that an undergrounding project is assessed on a case-by-case basis.

3.42 For example, when asked if undergrounding might occur 'somewhere sometimes' as part of an overall project, Mr Cox confirmed that the AER were not precluding undergrounding.[161] Rather, Mr Cox stated that this becomes a consideration for costs and benefits.

3.43 In a similar context, when asked if EnergyCo could see any feasibility to a hybrid approach, Mr Kingsmill confirmed that future projects would be assessed on a case-by-case basis.[162]

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155 Evidence, Associate Professor Dargaville, 16 February 2024, p 18.

156 Evidence, Mr Hollis, 16 February 2024, p 43.

157 Evidence, Mr Hollis, 16 February 2024, p 43.

158 Evidence, Associate Professor Roger Dargaville, Interim Director, Monash Energy Institute – Monash University, 16 February 2024, p 17.

159 Evidence, Associate Professor Dargaville, 16 February 2024, p 18.

160 Evidence, Associate Professor Dargaville, 16 February 2024, p 17.

161 Evidence, Mr Cox, 16 February 2024, p 5.

162 Evidence, Mr Kingsmill, 16 February 2024, p 35.

Lack of a social licence for transmission infrastructure projects

3.44 One of the key issues examined in this inquiry was whether the HumeLink and Central-West Orana projects had social licence, in part due to the perceived poor community consultation throughout the project. The committee received evidence from impacted communities, landowners and industry experts that early and broad acceptance of significant projects is important for ensuring the ongoing social licence of the project.

3.45 Some witnesses spoke about the lack of social licence for HumeLink and how crucial it is for energy providers and the Government to genuinely engage the community, not just in the planning process for infrastructure projects, but in the consideration of all options and in the broader energy vision for the nation.

3.46 For example, witnesses from Monash University explained how poor community engagement processes had left communities feeling sidelined and more likely to oppose the project. Professor Yolande Strengers, Associate Dean - Equity, Diversity and Inclusion, Monash University, told the committee that the consultation with community on these projects was either absent, or took place too late in the process to have any effect:

> The critical problem we have at the moment with all of these projects is that the community views and the opportunity for genuine consultation is either not there or comes so late in the project that it really isn't seen as genuine and, as you've said, the decision has been made'.[163]

3.47 She further stated that when information was presented to the community, it was done so in a way that suggested a decision was final, with little opportunity for feedback or input:

> [s]ome of the conversations that I've observed that are occurring are more, as you say, information sessions about the decisions that have been made, rather than a presentation of the options and of the considerations that have gone into the particular decision.[164]

3.48 Professor Strengers explained that Monash University's research showed that providing comprehensive and timely explanations for projects can reduce opposition to a project and may also help to bring previously sceptical communities onside:

> When people fully understand why a particular decision has come about—what the risks or the benefits are of the different options—they may actually come to the same conclusion or a similar conclusion as the regulator or the Government or whoever is doing the project. But because they're not part of those conversations and they're not actually presented with those options and they can't think about those things themselves, they essentially become defensive and resist the project. So we really have to avoid getting to that point by getting in as early as possible and really laying out the options for communities so that they can actually be part of that decision-making process.[165]

163 Evidence, Professor Yolande Strengers, Policy, Associate Dean – Equity, Diversity and Inclusion, Monash University, 16 February 2024, p. 16.

164 Evidence, Professor Strengers, 16 February 2024, p. 16.

165 Evidence, Professor Strengers, 16 February 2024, p. 16.

3.49 As an example of how appropriate consultation can change community views on transmission options, Professor Strenger's colleague, Associate Professor Roger Dargaville said:

> while most past social research with households indicates they prefer the undergrounding of distribution and transmission lines, but this may change when they understand the costs, disruption impacts and potential risks. Social research is needed to engage people in conversations about the options, opportunities and constraints of undergrounding transmission lines in the context of the broader energy vision and purpose for expanding the transmission network.[166]

3.50 The Farmers for Climate Action suggested that some of the contributing factors to a lack of social licence are:

- insufficient consultation with regional communities and landholders
- the absence of policies or guidelines to create an equitable framework to support communities and businesses, and
- access to clean energy which host communities generate.[167]

3.51 Farmers for Climate Action called for the development of a 'code of conduct that builds social licence for the acceleration of Australia's renewable grid in farming communities'.[168]

3.52 In a similar context, Ms Kean contended that in order to build social licence, meaningful community engagement as well as bespoke benefit sharing schemes should be considered.[169]

3.53 This view was supported by Stride Renewables who advocated for 'projects to meaningfully engage, and fairly share the economic value, with host communities'.[170]

3.54 Professor Strengers suggested that there needs to be a national conversation about the energy transition that involves all Australian communities.[171] In this context, Professor Strengers stressed that communities and households need to be involved in larger conversations about the energy transition, rather than just at a defined point where so-called social licence is required.[172]

3.55 Further, Professor Strengers stressed that with so many stakeholders involved in energy transmission projects, there was no central body 'taking responsibility for the community conversion and engagement' – something she saw as essential:

> …the number one thing that needs to happen is a central body or a central somebody—perhaps a body that already exists—taking the lead in the national conversation about this issue, and then the other players can follow with those more specific details about what does this transmission project or any project mean for a particular community. But without that overarching conversation about why is this transmission infrastructure

166 Evidence, Associate Professor Dargaville, 16 February 2024, p 15.
167 Submission 25, Famers for Climate Action, p 2.
168 Submission 25, Famers for Climate Action, p 5.
169 Evidence, Ms Kean, 27 November 2023, p 19.
170 Submission 41, Stride Renewables, p 2.
171 Evidence, Professor Strengers, 16 February 2024, p. 19.
172 Evidence, Professor Strengers, 16 February 2024, p 19.

> even needed, why do we need to put renewable energy projects where they're going, how is that supporting where the country is heading and what are the broader benefits—without that conversation, all those other conversations that are happening with companies on that more isolated and community scale are missing the bigger picture.[173]

3.56 Mr Adams praised the work currently being completed by the Energy Charter – a customer-centric body for the energy sector – which is currently developing its Better Practice Social Licence Guideline for transmission.[174] When asked directly about other ways of building social licence, Ms McElnea, Engagement Coordinator, Community Power Agency, suggested that when individuals have the ability to contribute and understand how their views are heard, there is a greater sense of collaboration.[175]

The adequacy of the community consultation and its impact on the social licence of electricity infrastructure projects

3.57 There was a strong sentiment from stakeholders that poor community consultation had contributed to a lack of social licence for the HumeLink project.

3.58 Mr Andrew Bray, National Director, RE-Alliance highlighted to the committee that poor consultation can get people offside from the beginning:

> …you go out with the wrong information, you don't talk to the right people, you're not clear about what it is you're doing and also you come across as trying to hide things, you get people offside to begin with. I think that's made the whole problem much more difficult than it should have been.[176]

3.59 In this regard, Mr Bray, agreed that initial engagement with communities impacted by the HumeLink project was poor and told the committee that Transgrid appeared to have acknowledged that, with an independent review undertaken of their engagement practices.[177]

3.60 There was a clear acknowledgement by Transgrid that their consultation with communities about the HumeLink project could have been better, with Mr Roberts admitting to the first inquiry that 'at the start, the consultation was not the best'.[178] He explained that Transgrid had fully adopted all recommendations of the independent review, including consultation approaches recommended by Mr Rod Stowe, former Commissioner, New South Wales Fair Trading.[179]

3.61 Mr Roberts also reported to this inquiry that Transgrid is working to improve their community engagement with stakeholders and communities.[180]

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173 Evidence, Professor Strengers, 16 February 2024, p 20.

174 Evidence, Mr Adams, 16 February 2024, p 22.

175 Evidence, Ms McElnea, 27 November 2023, pp 31-32.

176 Evidence, Mr Andrew Bray, National Director, RE-Alliance, 27 November 2023, p 31.

177 Evidence, Mr Bray, 27 November 2023, p 31.

178 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), p 41.

179 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), p 41.

180 Evidence, Mr Roberts, 16 February 2024, p 55.

3.62 Refer to chapters two and three of the first inquiry for further information on the views shared regarding the lack of social licence for the HumeLink project.[181]

3.63 Similar concerns were raised about the adequacy of consultation and engagement for the Central-West Orana REZ.

3.64 Mr Francis Bowman criticised EnergyCo's approach to community engagement, questioning 'how completing 44 interviews, where a population of 152,418 lived, was adequate to gather sufficient information from the community'.[182] Mr Bowman also told the committee that he was yet to meet a landowner who is 'willingly accepting the transmission infrastructure onto their land'.[183]

3.65 Ms Edwards shared similar views about the inadequacy of community consultation, stating that the Social Impact Assessment within the EIS for the Central-West Orana REZ was inadequate.[184] She indicated that as a Central West Community Reference Group member, this group was not consulted when EnergyCo completed its Social Impact Assessment.[185]

3.66 While not being a member of the Energy Charter, Mr Kingsmill said that with respect to EnergyCo's own community engagement practices and preferred infrastructure solutions, it aims to align to the Energy Charter's guidance and looks to 'continually improve in line with good industry practice'.[186]

3.67 Mr James Hay, CEO of the Energy Corporation of NSW noted EnergyCo's commitment to genuine community engagement and local support for infrastructure, as well as the need for continuous improvement:

> Everything we do, because it's all paid for by electricity consumers, has to be run through that reference. The Electricity Infrastructure Investment Act in its objectives specifically added in the words about fostering local community support, because it recognises that consumer licence—which is those who are paying for the infrastructure—isn't the same as local community support. EnergyCo is very, very focused on that local community support, and that's one of our objectives that we have to meet. The Act was a big step forward from the National Electricity Market in requiring us to focus on those factors. Are we learning as we go? Absolutely. Are we trying to constantly improve? Absolutely.[187]

181 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 9-53.

182 Submission 21, Mr Frances Bowman, p 2.

183 Submission 21, Mr Frances Bowman, p 2.

184 Submission 23, Mrs Edwards, p 5.

185 Submission 23, Mrs Edwards, p 5.

186 Evidence, Mr Kingsmill, 16 February 2024, p 35.

187 Evidence, Mr James Hay, Chief Executive Officer, Energy Corporation of NSW, 16 February 2024, p 35.

Broader considerations

3.68 This section explores broader considerations regarding energy transmission infrastructure, including the impacts of bushfires on both overhead and underground transmission lines, and stakeholder evidence on the role transmission lines play in causing bushfires.

Climate change

3.69 Many stakeholders emphasised the impacts of climate change as drivers behind the need for a prompt renewable energy transition and significant infrastructure projects in New South Wales. Some stakeholders focused on the need to act and build renewable energy transmission infrastructure promptly in order to support net zero targets, discussed earlier at 3.30.

3.70 Others described responding to climate change as an urgent necessity. For example, Ms Elinor Gerrard, Engagement Coordinator at Community Power Agency, said that in her view 'we need to rapidly act on climate change' following many years of inaction.[188]

3.71 Similarly, Mr Leigh Heaney, Manager, Government Relations, Smart Energy Council, agreed that responding to the challenges of a future climate challenges was essential, and that 'a strong economy and a safe climate is not just possible; it is critical'.[189]

3.72 For other stakeholders, emphasis was placed on the need to build climate resilient infrastructure in response to the risk posed by climate change. Mr Connor Woulfe, Policy, Legal and Research Adviser, Smart Energy Council, stated that climate change is likely to increasingly place considerable pressures on electricity infrastructure, noting the following consequences:

> 'We know that as climate change worsens over the coming decade or two decades, and we have more heatwaves and more unpredictable heatwaves, the blackouts and coal-fired power plants shutting down more irregularly and more frequently means that it's a really serious issue'.[190]

3.73 With respect to climate risk planning, Mr Hollis highlighted to the committee that Ausgrid had recently completed a climate risk forecast, addressing impacts such as wind, flood, bushfires, rain and heatwaves out to 2090.[191] He also told the committee that Ausgrid had submitted a proposal to the AER for five years of Commonwealth funding 'to start adapting to that increasing climate risk…include[ing] a wide range of initiatives, both working with the community to make them more resilient but also looking at the network and how we make the network more resilient'.[192]

188 Evidence, Ms Elinor Gerrard, Engagement Coordinator, Community Power Agency, 27 November 2023, p 29.

189 Evidence, Mr Heaney, 27 November 2023, p 27.

190 Evidence, Mr Connor Woulfe, Policy, Legal and Research Adviser, Smart Energy Council, 27 November 2023, p 30.

191 Evidence, Mr Hollis, 16 February 2024, p 44.

192 Evidence, Mr Hollis, 16 February 2024, p 45.

3.74 Additionally, Ms Jordan informed the committee that a similar resiliency plan was completed by Transgrid, including factors such as flood, wind, frequency or events and standards of transmission design.[193]

3.75 Further, EnergyCo and Transgrid noted improvements in design standards to ensure transmission infrastructure can withstand more extreme weather events. For example Mr Kingsmill advised the committee:

> There is always a balance in terms of cost versus resilience. I know that in Queensland, when they designed their transmission lines, they designed them to cyclonic wind ratings where they are in that part of the State. I think design standards are fairly key there, but I can assure the panel that we have taken that into account in our design standards.[194]

3.76 Mr Roberts also noted:

> The standards that we apply, the AS 7000 standards, specifically say, for the HumeLink example, they are built to at least a minimum of 165 kilometres per hour wind, up to 200 kilometres per hour wind gusts—as opposed to, I'm led to believe, the wind gusts that occurred in Victoria a couple of days ago were 130 kilometres per hour. The standards we build to now are far higher.[195]

3.77 Refer to chapter two of the prior Standing Committee report for further evidence received by that committee, in relation to climate change.[196]

Expertise and resource availability

3.78 The committee also heard about the lack of skillsets within Australia to support the progression of underground transmission lines, as well as the difficulty and cost of obtaining necessary materials to remain competitive and for access to energy to remain efficient. Mr Dominic Adams, General Manager – Networks, Energy Networks Australia, expressed the need to have sufficient access to people and the required skills, given the fundamental position occupied by energy in the economy:

> Energy is one of the core planks of our whole economy. You need efficient access to capital, efficient access to people and skills, and efficient access to energy. It's one of the core planks upon which our whole economy is built, so it's really important to get it right for our competitiveness as a country and as a State.[197]

193 Evidence, Ms Jordan, 16 February 2024, p 51.

194 Evidence, Mr Kingsmill, Executive Director, Network Planning and Technical Advisory, Energy Corporation of NSW, p 36.

195 Evidence, Mr Jeremy Roberts, Major Project Delivery Director, Transgrid, 16 February 2024, p 53.

196 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 33-34.

197 Evidence, Mr Dominic Adams, General Manager - Networks, Energy Networks Australia, 16 February 2024, p 28.

3.79 In this context, the committee was informed by Mr Ricardo da Silva Alvarez, Business Development Manager, Iberdrola Australia, that in a global landscape, Australia would be competing for the required skillsets, workforce, resources and supply requirements.[198]

3.80 Other witnesses were asked directly about the current state of Australian expertise on undergrounding. For example, when asked if there was any expertise about undergrounding transmission lines in Australia, Mr Andrew Kingsmill of EnergyCo told the committee that there was 'a number of Australian engineers that are part of an international consortium called CIGRE'.[199] According to the organisation's website, CIGRE is 'a global community committed to the collaborative development and sharing of end to end power system expertise'.[200]

3.81 Mr Hollis informed the committee of Ausgrid's experience in underground technology and explained that in the last fifteen years, Ausgrid has installed 150 kilometres of undergrounded transmission lines and 100 kilometres of overhead electricity infrastructure.[201] However, Mr Hollis was less confident the skillset to implement 'cutting edge HVDC technology' currently exists in Australia.[202]

3.82 Ms Les Brand told the committee that he did not think the necessary experience in building 500-kV underground transmission lines existed anywhere in the world. However, he went on to suggest that this was not necessarily a barrier, given the fact that 'every HVDC project is necessarily a higher voltage…every project is necessarily going to be bigger', referring to '525-kV projects being developed in Australia' as an example of this.[203]

3.83 Ms Marie Jordan, Executive General Manager, Transgrid, suggested the expertise gap was more one of 'engineering and construction capability' and that the challenge for implementing a large-scale HVDC solution would be one of resourcing:

> I think Australia as a whole does not have a lot of resources for the construction activity, some of the engineering. Also, when we've talked about the feasibility of HVDC at this time, just the availability of the components is a huge impact on trying to get the construction built in time.[204]

3.84 When asked if there would be any problem in bringing the necessary expertise into the country, Mr Frank de Wild, Business Director and Senior Business Consultant, DNV shared his views from an international perspective, and said he thought it would be possible for Australian companies to build expertise in underground transmission lines.[205] Further, Mr de Wild stressed that many countries which previously did not have the expertise have it now because they opted to start collecting and building that experience:

198 Evidence, Mr Ricardo da Silva Alvarez, Business Development Manager, Iberdrola Australia, 16 February 2024, p 24.

199 Evidence, Mr Kingsmill, 27 November 2023, p 39.

200 CICGRE, Introducing CIGRE, https://www.cigre.org/GB/about/introducing-cigre.

201 Evidence, Mr Hollis, 16 February 2024, p 40.

202 Evidence, Mr Hollis, 16 February 2024, p 42.

203 Evidence, Mr Brand, 27 November 2023, p 8.

204 Evidence, Ms Jordan, 16 February 2024, p 49.

205 Evidence, Mr Frank de Wild, Business Director and Senior Business Consultant, DNV, 16 February 2024, p 10.

> If we look to history, there has been a time that also in Europe there were many countries which did not have underground cable expertise; now they do have. Why? Because they stepped over and started to collect experience with undergrounding power cables—also for the very high voltage levels. So that has been happening. It has very positive effects in these countries.[206]

Impacts of bushfires

3.85 The committee received a large number of submissions discussing the appropriateness of using overhead powerlines in bushfire-prone areas, given the purported links between bushfires and overhead transmission lines.

Overhead transmission lines, underground transmission lines and bushfires

3.86 A number of stakeholders raised concerns about the risk that overhead transmission lines posed as a result of climate change and the predicted increase in the frequency and severity of severe weather-related events, including bushfires.

3.87 The HumeLink Alliance Inc noted that New South Wales Government completed an inquiry into the 2019-20 Summer bushfires, also known as the 'Black Summer' bushfires which found 'the NSW Rural Fire Service (RFS) attributed powerlines as the cause of some of the larger, destructive fires'.[207] The Alliance also told the committee that this inquiry heard that two of four recent emergency-level fires in Western Australia in 2020 and five of eleven fires in Victoria from 2009 were found to have been caused by electricity assets.[208]

3.88 When asked about the bushfire risk of overhead transmission lines compared to underground transmission lines, Mr Andrew Kingsmill, Executive Director, Network Planning and Technical Advisory, Energy Corporation of NSW (EnergyCo) responded that a '500 kilovolt line has never started a bushfire in Australia'.[209] The submission from Energy Co also stated that the risk of a resultant bushfire is 'generally considered to be virtually zero, for both underground and overhead solutions'.[210]

3.89 Mr Kingsmill stressed that where bushfires had started previously, such as the 2019-20 Black Saturday and Kinglake bushfires in Victoria, they were on 'far lower voltage assets …and single-wire earth return [technology]'.[211] For higher voltage overhead transmission lines, where 'the easements are wider, where the lines are higher off the ground and where there isn't as much encroachment from trees on the line' there is less of a risk.[212]

3.90 Some witnesses in the first inquiry appeared to support the view that lower voltage transmission lines were the biggest risk. Mr Ian Chaffey, Major of Snowy Valleys Council, said that 'if you

206 Evidence, Mr de Wild, 16 February 2024, p 10.
207 Submission 12, HumeLink Alliance Inc, Attachment 2, p 12.
208 Submission 12, HumeLink Alliance Inc, Attachment 2, p 12.
209 Evidence, Mr Kingsmill, 27 November 2023, p 35.
210 Submission 35, EnergyCo, p 11.
211 Evidence, Mr Kingsmill, 27 November 2023, p 35.
212 Evidence, Mr Kingsmill, 27 November 2023, p 35.

look at the cause of fires, basically it's on the lower voltage HV lines in our shire—66 kV, 20 kV, 22 kV lines clashing, that sort of thing, in a climatic condition'.[213]

3.91 When asked directly about whether underground transmission lines have the potential to cause bushfires, Mr Kingsmill informed the committee that as he understands it, the risk is virtually zero.[214] However, Mr Kingsmill did acknowledge that submissions to this inquiry expressed the point that overhead lines are more susceptible to natural hazards.[215]

3.92 In its submission to the committee, Iberdrola Australia highlighted that undergrounded high voltage transmission lines have 'reduced fire risk and increased reliability during bushfires'.[216] However, Iberdrola Australia also noted that 'any part of an undergrounded asset which is exposed above the ground can be damaged during a bushfire and can be hard to fix'.[217]

3.93 Asked whether underground transmission lines could be impacted by bushfires, Mr Brand informed the committee that he had 'never heard of a HVDC cable being impacted by a bushfire above ground'.[218]

3.94 Further, in evidence received from EnergyCo, it was stated that underground lines are 'typically unaffected by aboveground fires – grass and scrub fires move quickly enough that the temperature of the ground surrounding the cable is not raised significantly'.[219]

Barriers to fighting fires near overhead transmission lines

3.95 On the matter of impacts to firefighting efforts, community members described their safety concerns around overhead powerlines and the barriers to fighting fires posed by these lines.

3.96 In this context, the Snowy Valleys Council, located along the route of the HumeLink project, suggested that their ability to manage a bushfire effectively could be hampered by obstruction from overhead electricity lines.[220] This evidence was also received during the first inquiry, where Mr Ian Chaffey, Mayor of Snowy Valleys Council described what he felt was a 'complete lack of understanding' on the part of Transgrid around the difficulties of fighting fires under these powerlines, particularly during the 2019-20 bushfires:

> It's hard enough to fight fires in the sort of situation that we had there without these impediments across the landscape…when you've got these structures which you can't see in light of the smoke and the environment you're fighting in, that limits your ability to fight fires anyway. The issue that we confronted in 2019 and 2020 here was horrific. We lost 48,000 hectares of pine trees, all because we couldn't fight them, and some of those restraints revolved around the presence of high voltage transmission lines. And

213 Evidence, Mr Ian Chaffey, Mayor, Snowy Valleys Council, 26 July 2023, p 2.

214 Evidence, Mr Kingsmill, 27 November 2023, p 35.

215 Evidence, Mr Kingsmill, 27 November 2023, p 37.

216 Submission 31, Iberdrola Australia, p 4.

217 Submission 31, Iberdrola Australia, p 4.

218 Evidence, Mr Brand, 27 November 2023, p 8.

219 Submission 35, EnergyCo, p 15.

220 Submission 57, Snowy Valleys Council, p 1.

> now they're contemplating infinitely higher voltages, which again make a greater restriction on your ability to fight fires.[221]

3.97 During the same inquiry, Mrs Helen Dalton, Member for Murray told the committee at a public forum in Deniliquin that the life of a part-time helicopter pilot was lost, due to the pilot hitting overhead powerlines in her local area.[222]

3.98 Similar concerns were shared by an impacted landowner from the Gilmore Valley, who argued that firefighting equipment such as tankers and helicopters would not be able to assist with ground operations and that fire crews 'will be expected to risk their lives to fight these fire[s] by hand'.[223]

3.99 Another landowner impacted by the HumeLink project said that they not only feared the increased risk of bushfires, but also the danger that overhead infrastructure presents to aerial firefighting.[224] This was highlighted to be 'of extreme importance in our area due to the topography'.[225]

3.100 As noted in the first inquiry's report, the senior RFS representative who gave evidence at the inquiry was unable to say either that high voltage transmission lines would cause more fires that do occur worse than they would otherwise be.[226]

Impacts to overhead lines by bushfires

3.101 The committee also heard evidence on the impact of bushfires on overhead infrastructure, in particular whether bushfires had impacted the transmission or disrupted the supply of power.

3.102 In the first inquiry, Mr Ian Chaffey, the Major of Snowy Valley Council told the committee that the 2019-20 bushfires had resulted in the loss of power for 14 days and that to continue to rely on overhead AC powerlines for electricity transmission 'is a recipe for disaster'.[227] Mr Chaffey also asserted that the chance of a 'corona effect' – which is an arc of electricity from the overhead line to the ground – is 'significantly increased' with overhead powerlines.[228]

3.103 The HumeLink Alliance Inc told the committee during first inquiry that some of the damage caused by the 2019-20 Snowy Mountains bushfires in 2019-20 'took three months to repair'.[229] According to the Transgrid report on the fires entitled *'Overview of the 2019-20 Bushfire Damage to Transgrid's Network',* the 2019-20 summer bushfires resulted in:

- four of the 330 kV lines tripped, which caused regional separation to the NEM between NSW from Victoria

221 Evidence, Mr Ian Chaffey, Mayor, Snowy Valleys Council, 26 July 2023, p 2.

222 Evidence, Mrs Helen Dalton MP, Member for Murray, 16 August 2024, p 7.

223 Submission 48, Name suppressed, p 1.

224 Submission 46, Name suppressed, p 1.

225 Submission 46, Name suppressed, p 1.

226 Evidence, Mr Jayson McKellar, Director Area Operations (Northern), Assistant Commissioner, Rural Fire Service, 27 July 2023, p 19.

227 Evidence, Mr Ian Chaffey, Mayor, Snowy Valleys Council, 26 July 2023, p 2.

228 Evidence, Mr Chaffey, 26 July 2023, p 2.

229 Submission 106b, HumeLink Alliance Inc, p 4.

  - one of those four lines had sufficiently damaged insulators, where it was not possible to instantly re-energise the line

- whilst restored in 20 minutes, Tumut and surrounding areas lost its power supply for approximately two hours, as Low Voltage Circuit Breaker could not be immediately restored.[230]

3.104 In relation to the impacts from a bushfires on overhead infrastructure, Mr Kingsmill informed this committee that throughout the 2019-20 bushfires the 'backbone…of the New South Wales electricity system was returned to service and continued in service'.[231] In response to questions on notice, EnergyCo provided further detail, stating that there were 12 trips on the 500kV transmission line, which included:

- nine occasions where the lines were able to self-heal and were restored in 20 seconds
- three occasions where the power was manually returned to service in 24 minutes or less.[232]

3.105 In his evidence, Mr Kingsmill added that when impacted by lightning strike or fire under a line, the system is designed to self-heal.[233] Further, Mr Kingsmill cited that for most natural hazards, the infrastructure will self-heal once the event has passed.[234]

3.106 Transgrid was also questioned about the impact of the 2019-20 bushfires on their network, as well as their report entitled *'Overview of the 2019-20 Bushfire Damage to Transgrid's Network'*.[235] In response, Mr Roberts, referred to five significant events:

> three loss of supply to Transgrid customers, one event affecting the access generation, and one result in the loss of supply and separation to Victoria. The three loss of supply events to customers were restored within 25 minutes. Our records indicate that in relation to the Dunns Road fire, which burned within the Snowy Valley government area from 28 December 2019 to 15 February 2020, Transgrid's control centre received five requests to de-energise our network. These requests were actioned.[236]

3.107 Mr Roberts stressed to the committee that a significant amount of Transgrid's focus is the prevention of bushfires, stating that around fifty percent of Transgrid's maintenance budget is directed toward mitigating its bushfire risk, through vegetation removal or replacing required

230 Transgrid, 'Overview of the 2019-20 Bushfire Damage to Transgrid's Network (13 November 2020), p 13, https://www.aer.gov.au/system/files/A.2_%202019-20%20%20Bushfire%20Damage%20to%20Transgrid%20Network_%20FINAL_PUBLIC_Redacted.pdf.

231 Evidence, Mr Kingsmill, 27 November 2023, p 37.

232 Answers to question on notice, EnergyCo, 9 January 2024, p 2.

233 Evidence, Mr Kingsmill, 27 November 2023, p 37.

234 Evidence, Mr Kingsmill, 27 November 2023, p 37.

235 Transgrid, 'Overview of the 2019-20 Bushfire Damage to Transgrid's Network (13 November 2020), https://www.aer.gov.au/system/files/A.2_%202019-20%20%20Bushfire%20Damage%20to%20Transgrid%20Network_%20FINAL_PUBLIC_Redacted.pdf.

236 Evidence, Mr Roberts, 16 February 2024, p 53.

infrastructure.[237] The Transgrid report on the 2019-20 bushfires also outlines the preventative measures taken during these bushfires, including:

- 'the decision on several occasions to pre-emptively dispatch staff to critical interconnector sites to ensure that in the event of fire causing an interruption, that staff were on hand that could respond immediately to reduce any potential impacts' and
- 'the dispatch of staff at other times to locations that were likely to be cut off by intervening bushfires… to ensure that Transgrid could respond to faults, failures and outages without being cut off from accessing critical sites'.[238]

Effect on natural environment and cultural heritage

3.108 Like the first inquiry, the impacts of both overground transmission lines and underground transmission lines on the natural environment and cultural heritage were raised by many stakeholders.

3.109 For example, Mr Kingsmill suggested that overhead transmission lines may be the better option in environmentally or culturally sensitive areas, as the route may be able to be altered to minimise impact through areas, if the topology of the land is right.[239] Additionally, Mr Kingsmill said that it was possible to route overhead lines so that there would be no requirement to clear vegetation below the lines, in some circumstances.[240] He told the committee that a wide range of considerations are taken into account when considering the route of a transmission line, including biodiversity impacts.[241]

3.110 A similar view was supported by Mr Roberts, who stated that the trenching of underground lines impacts cultural or heritage sites.[242] Further, he stated that some cultural heritage concerns can be better addressed via overhead lines.[243]

3.111 In contrast, Professor Peta Ashworth, Director, Curtain Institute of Energy Transition told the committee that overhead powerlines can create a barrier effect, 'where biodiversity is negatively impacted by changes in bird migration patterns because of collision and avoidance of the transmission lines'.[244]

3.112 Professor Ashworth suggested that using underground infrastructure could somewhat mitigate biodiversity impacts in connection with overhead powerlines.[245] However, Professor Ashworth

237 Evidence, Mr Roberts, 16 February 2024, p 53.

238 Transgrid, 'Overview of the 2019-20 Bushfire Damage to Transgrid's Network (13 November 2020), https://www.aer.gov.au/system/files/A.2_%202019-20%20%20Bushfire%20Damage%20to%20Transgrid%20Network_%20FINAL_PUBLIC_Redacted.pdf.

239 Evidence, Mr Kingsmill, 27 November 2023, p 36.

240 Evidence, Mr Kingsmill, 27 November 2023, p 36.

241 Evidence, Mr Kingsmill, 27 November 2023, p 35.

242 Evidence, Mr Roberts, 16 February 2024, p 55.

243 Evidence, Mr Roberts, 16 February 2024, p 55.

244 Submission 13, Professor Peta Ashworth, p 8.

245 Submission 13, Professor Peta Ashworth, p 8.

added that underground transmission lines 'may cause soil degradation and hydrological alterations throughout the lifetime of underground lines'.[246]

3.113 Although, EnergyCo's submission noted:

> Continual maintenance of both the underground cable and the easement are required. Due to the sensitivity of the asset, deep-rooted plants are not permitted within easement areas, 28 to avoid damage to the cables. This inhibits biodiversity recovery following construction, and prevents agricultural cropping. By contrast, within overhead line easements trees and shrubs of a height of less than 3 m are permitted'.[247]

3.114 In their evidence, Upper Lachlan Landcare suggested that the HumeLink project will have 'long lasting and irreversible impacts on local biodiversity and connectivity'.[248] Further, they added that the negative impacts were unable to be offset by revegetation efforts and believed that underground transmission lines provide the favored solution to minimise destruction to the area.[249]

3.115 Similar views were shared by Goulburn Mulwaree Council, suggesting that undergrounding the infrastructure for the HumeLink project would reduce the impacts to biodiversity associated with the clearing of larger corridors, where the infrastructure is placed above the ground.[250]

3.116 Similar evidence expressing a preference for undergrounding on an environmental bases was heard at the first inquiry, where the National Parks Association of NSW advocated for Transgrid and Snowy Hydro 'wherever feasible to rationalise and replace overhead transmission lines with underground connections' in order to mitigate environmental impacts.[251]

3.117 However, Mr James Hay, CEO of EnergyCo suggested that the perception of undergrounding as having less of an impact on the environment was not necessarily correct and that the actual effect of undergrounding on the environment was not fully appreciated:

> In my experience—and I've done a lot of underground work on different infrastructure—I think the debate around undergrounding high voltage transmission lines still hasn't really looked, particularly from a biodiversity and environmental point, at the nature of the impacts. They are at least as significant as overgrounding. The kind of disturbance and the impact on landowners is much greater…. You've got these joining stations about every kilometre, or maybe every 800 metres, over those lands, and those are not insignificant surface structures on their land that need to be accessed, and you need to not have certain activity on top of those cables. In our submission we talked about the trench being well over 40 metres. The construction of that will be another 40 metres outside that, and every inch above the ground has got to be affected. The biodiversity and environmental impacts of that I don't think have been fully appreciated or understood.[252]

246 Submission 13, Professor Peta Ashworth, p 8.

247 Submission 35, Energy Corporation of NSW, p 14.

248 Submission 24, Upper Lachlan Landcare, p 1.

249 Submission 24, Upper Lachlan Landcare, p 1.

250 Submission 20, Goulburn Mulwaree Council, p 1.

251 Submission 95, National Parks Association of NSW, p 2.

252 Evidence, Mr Hay, 16 February 2024, p 36.

Effect of easements on the natural environment

3.118 The comparison of easements which were required for the current overhead option of the HumeLink project was another point called into question, by witnesses and from submissions made to the inquiry. While some stakeholders thought underground transmission lines had less of an effect on surrounding biodiversity due to the smaller land corridors required, others said that the clearing required for the easements still required significant clearing of land.

3.119 Mr Brand reported to the committee that the size of the easements would vary, depending on the placement of the underground 500 kV HVDC transmission lines. The committee was informed that this would be impacted by heating impacts from the transmission lines, in addition to the construction and maintenance preferences.[253]

3.120 In a similar context, Mr Brand cited that the size of land easements to accommodate trenches for underground infrastructure could be up to approximately 20 metres.[254]

3.121 When directly questioned about trench easements for electricity transmission infrastructure, Mr Kingsmill informed the committee that this would be between 30 to 40 metres, depending on the capacity and how many transmission lines. Further Mr Kingsmill added:

> Typically for construction, the advice that we've received is that you would add another 30 metres, roughly. But those estimates vary. Some are slightly less and some are slightly more.[255]

3.122 In the related context of factors impacting easement sizes for AC underground transmission lines, Mr Hollis highlighted to the committee that two to three times the number of transmission lines would be needed to meet desired capacity requirements.[256]

Opportunities to route over sensitive areas

3.123 In relation to route design, stakeholders also discussed the capacity for overhead infrastructure lines to be modified to accommodate environmentally significant areas.

3.124 Mr Kingsmill stated that when determining an infrastructure route, biodiversity-type impacts, topology, construction and land usage were all considerations taken into account.[257] Where a proposed route was predicated to pass through environmentally or culturally sensitive areas, Mr Kingsmill said that there is an ability for overhead lines to be re-routed or to be placed in a way that requires minimal clearing:

> …is possible to route lines around those areas or to minimise impact through those areas, even such that, if the topology is right, it's possible to route them so that there is no need to clear the vegetation under the lines—for example, if they are routed on two sides of the valley.[258]

253 Evidence, Mr Brand, 27 November 2023, pp 8-9.

254 Evidence, Mr Brand, 27 November 2023, p 9.

255 Evidence, Mr Kingsmill. 27 November 2023, p 40.

256 Evidence, Mr Hollis, 16 February 2024, p 46.

257 Evidence, Mr Kingsmill. 27 November 2023, p 35.

258 Evidence, Mr Kingsmill. 27 November 2023, p 36.

3.125 Mr Hollis agreed that overgrounding often provided a more technically feasible solution that overgrounding in 'environmental hotspots', allowing these areas to be avoided.[259]

Thermal backfill around underground transmission infrastructure

3.126 Stakeholders also discussed the clearing required for the laying of underground transmission lines and specifically, the need to backfill trenches dug for the transmission lines with thermally stable backfill.

3.127 On the mater of backfilling around underground transmission lines, Mr Brand didn't necessarily support the view that thermal resistivity backfill was required to replace their entire trench[260]. In evidence to the committee, Mr Brand was of the view that only part of the area around the transmission lines is able to be replaced. [261]

3.128 However, Transgrid disputed this, and said they did not agree that limited thermally stable backfill was not required.[262] In evidence to the committee, Ms Marie Jordan, Executive General Manager – Network, Transgrid, confirmed that that thermally stabilised backfill (TSB) would be required for AC underground and 500 kV underground lines, respectively.[263] In this context, Mr Kingsmill agreed that thermal fill would be required, but that its use would be assessed on a 'case-by-case basis … [using] … thermal software on the cross-section of the cable'.[264]Mr Hollis was asked further about the environmental impacts of undergrounding infrastructure, which in his view, 'are quite significantly worse than overhead'.[265] Mr Hollis described the thermal backfill as 'effectively just a cement slurry' which 'tends to screw up the drainage and it also tends to limit any root structures that can go down'.[266]

Impacts on farming and to landowners

3.129 A key issue raised during this inquiry was the impact of both types of electricity transmission infrastructure on farms and on landholders. A wide array of views were shared, including concerns on how both the HumeLink and individual REZ projects would negatively detriment properties. Themes raised to the committee included the devaluation of properties, what may grow above infrastructure trenches, the disruption to farming under the easements and visual amenity.

Devaluation of properties

3.130 Landowners impacted by overhead infrastructure expressed concerns about the potential devaluation of their properties, if easements are placed over their land to host transmission infrastructure. The size of these potential easements is discussed above at 3.117.

259 Evidence, Mr Hollis, 16 February 2024, p 46.

260 Evidence, Mr Brand, 27 November 2023, p 9.

261 Evidence, Mr Brand, 27 November 2023, p 9.

262 Email from Ms Ashton, Transgrid, to Chair, 15 December 2023.

263 Evidence, Mr Hollis, 16 February 2024 and Ms Marie Jordan, Executive General Manager – Network, Transgrid, 16 February 2024, p 50

264 Evidence, Mr Kingsmill, 27 November 2023, p 38.

265 Evidence, Mr Hollis, 16 February 2024, p 46.

266 Evidence, Mr Hollis, 16 February 2024, p 46.

3.131 In evidence presented to the committee, ReD4NE was of the view that diminishing property values had impacts on neighbouring communities, not just individual landholders and that it was 'unacceptable to just pay host landholders some compensation'.[267]

3.132 Similar views were expressed by landowners and communities impacted by the HumeLink project. Mr David Bowman argued in his submission that overhead power lines will devalue rural land, noting a reluctance from landholders to host such infrastructure on their properties.[268]

3.133 Landowners of impacted properties are awarded compensation for easements of infrastructure lines. This takes into consideration the line length within the landholding, the easement width, proposed easement area, number of structures on the property and the indicative structure footprint.[269] Compensation may also be awarded for relocation of livestock and the use of powerline routes to move equipment and workers on the site.[270]

3.134 In this context, Mr Bray noted that landowners would be compensated up to $200,000 per kilometre, noting that for some landholders, this would make a difference to their financial position. However, Mr Bray also acknowledged that, notwithstanding this compensation, some landholders would prefer not to have infrastructure on their land at all.[271] In this regard, Mrs Rosemary Miller argued that the proposed compensation would 'never fully compensate the loss of value of their property with HumeLink being above ground'.[272]

3.135 Similarly, Mr Piper said that given the loss of value to land for the Central-West Orana REZ project, he did not believe the level of compensation was adequate.[273]

Potential effects on agriculture

3.136 The committee also heard conflicting evidence about the land use permitted on top of or around easements for underground transmission lines.

3.137 In his evidence, Mr Brand acknowledged that there have been varying comments as to what can grow above undergrounded electricity infrastructure transmission lines. When directly asked about impacts to farming, Mr Brand asserted that farming and cropping may still occur above undergrounded transmission lines but that orchards with deep rooted trees may not be possible.[274] This view was supported by Mr Kingsmill from EnergyCo, who noted that as access to the underground transmission lines is required at all times, crops or plantings with deep root systems may be restricted.[275]

267 Submission 73, ReD4NE, p 7.

268 Submission 5, Mr David Bowman, p 1.

269 Transgrid, HumeLink: Landowner Easement and Compensation Guide (January 2023), https://www.Transgrid.com.au/media/uqefurnr/tran_302377_landowner-compensation-brochure-update-january-2023_v3.pdf.

270 Evidence, Mr Piper, 27 November 2023, p 15.

271 Evidence, Mr Bray, 27 November 2023, p 31.

272 Submission 6, Mrs Rosemary Miller, p 3.

273 Evidence, Mr Piper, 27 November 2023, p 14.

274 Evidence, Mr Brand, 27 November 2023, p 9.

275 Evidence, Mr Kingsmill, 27 November 2023, p 40.

3.138 With regards to grazing and cropping under overhead transmission lines, Mr Brand acknowledged it was possible, with the 'right clearances'.[276]

3.139 Mr Hollis was less convinced of the viability of farming above undergrounded transmission lines, arguing that large shrubs or other agricultural uses are generally not possible, but that grass may grow and the area may be suitable for grazing in relation to farming practices.[277] Mr Kingsmill reported to the committee that there have been noted cases in Germany, where farmers indicated that crops are affected by heating from underground transmission lines.

3.140 In responding to questions on notice, EnergyCo said that in the circumstance of undergrounded transmission lines, restrictions on agricultural activities included 'ploughing and growth of deep-rotted plants'.[278]

3.141 The committee also heard evidence on the impacts to farming, as a result of overhead electricity transmission lines from both the HumeLink and the Central-West Orana REZ projects. Of the evidence received, concerns included impacts to farming on easement areas and impacts associated with easements impacting adjacent farming activities.

3.142 Mr Piper noted further impacts to farming in his evidence, citing concerns from impacted neighbours. Primary concerns included manoeuvring farm machinery under overhead powerlines.[279] Noting the limitation of a 4.3 metre clearance requirement, Mr Piper explained that farming equipment such as spray rigs and harvesters are already above that height.[280]

3.143 In a related context, Mr Piper added that there will be impacts to farming during the construction period of the Central-West Orana REZ project. In his evidence, Mr Piper expressed that these impacts include relocating livestock, and using easement which may traverse farmland areas as internal roads.[281]

3.144 In its submission to the committee, CWO REZist made further arguments on the impacts on farming. It was highlighted that:

> this predominately agricultural area of the CWO REZ [Central-West Orana REZ project] would affect our ability to produce food in the short and long term, and negatively affect the income of farmers in impacted areas, at the very least during the construction period.[282]

3.145 At the first inquiry, Mr Donald Bull, an impacted community member, told the committee that the proposed HumeLink overhead power lines would affect farming practices, prohibiting the use of both aerial sprayers and water planes.[283]

276 Evidence, Mr Brand, 27 November 2023, p 9.

277 Evidence, Mr Hollis, 16 February 2024, p 46.

278 Answers to questions on notice, EnergyCo, 9 January 2024.

279 Evidence, Mr Piper, 27 November 2023, p 15.

280 Evidence, Mr Piper, 27 November 2023, p 15.

281 Evidence, Mr Piper, 27 November 2023, p 15.

282 Submission 27, CWO REZist, p 8.

283 Evidence, Mr Donald Bull, 16 August 2023, p 27.

3.146 At a public forum in Tumut during the first inquiry, Mr Jim Morgan relayed a story of an aerial crop duster working over overhead powerlines, in order to explain the impact these lines can have on individual famers and landowners. He explained:

> [O]n my property at Lockhart, they had an aerial crop duster flying. He passed over the powerlines about 10 times and then, one of his runs, he connected with the powerlines. This was in 2021. He brought down 3.5 kilometres of double powerlines, broke off two cement poles—got away with his life, fortunately. He didn't crash the plane. That cost that company $27,000 in repairs, and that company wore the whole cost of that because their excess is greater than that. But that was a cost to an individual with powerlines.[284]

3.147 Further, Mr John Gormly, an impacted farmer stated that his cropping contractor will not work near or under high voltage powerlines.[285] In this context, Mr Gormly reported that his agricultural income options will change, due to the loss of an income stream, that 'may make the farm economically marginal'.[286]

3.148 A Dunedoo district farmer, Miss Emma Bowman, shared similar sentiment, reporting in her evidence that impacts to farming would be dependent on the season, but would likely impact livestock, resulting in some properties not remaining operational.[287] The submission also noted that 'construction may also result in crops not being sown'.[288]

3.149 In the context of the HumeLink project, one impacted farmer reported in evidence that critical weed management cannot be made as a result of a helicopter landing pad becoming untenable.[289] Further, alternatives such as traversing the land by motor vehicle were cited not possible, due to the nature of the farmland terrain.[290]

3.150 For further information on evidence associated with impacts to landholders impacted by the HumeLink project, refer to chapter two of the prior Standing Committee report.[291]

Visual amenity

3.151 Visual amenity was a concern which was specifically mentioned as a result of overhead powerlines being constructed on the Central-West Orana REZ project.

3.152 In their submission, CWO REZist suggested that overhead transmission towers would be up to 72 metres tall and seen further than 2km. The evidence gave a comparison to the height of the Sydney Opera House, which was reported to be 67.4 metres tall.[292] In this context, the

284 Evidence, Mr Jim Morgan, 26 July 2023, p 31.

285 Submission 9, Mr Ray Gormly, p 1.

286 Submission 9, Mr Gormly, p 1.

287 Submission 44, Miss Emily Bowman, p 1.

288 Submission 44, Miss Bowman, p 1.

289 Submission 15, Name suppressed, p 3.

290 Submission 15, Name suppressed, p 3.

291 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 22-26.

292 Submission 27, CWO REZist, p 8.

organisation suggested that 'there will be a marked negative impact on visual amenity for rural residents of the REZ.'[293]

3.153 When referring to the visual impacts imposed by the HumeLink project, Mr Kingwill contended that the Gillmore Valley would be turned into the ugly valley, with an '80 metre tower every 350 metres with 24 conductors'.[294]

3.154 Similarly, in its submission to the committee, ReD4NE argued that in relation to overhead electricity transmission infrastructure, members of the community, 'bush or city alike, would like to see an end to antiquated technology'.[295]

3.155 Ms Elianor Gerrard, Engagement Coordinator, Community Power Agency, told the committee that undergrounding of such infrastructure was a solution where lines pass close to highly populated areas or where visual amenity is considered.[296]

3.156 Iberdrola Australia also spoke of the benefit of the technology in this regard, noting that underground transmission lines have the advantage of being hidden from view and minimizing visual impacts.[297]

3.157 When asked directly about reasons as to why transmission transmission lines should be undergrounded, Mr de Wild noted there were many reasons for this, including removing the visual presence of infrastructure, preserving a nature reserve or when wanting to preserve a countryside view.[298]

3.158 Ms Amy Kean, Director, Stride Renewables suggested that monopoles, which have a less intrusive design than traditional transmission lines, might offer a viable solution to visual amenity concerns, as they have been used overseas to lessen visual impacts.[299]

3.159 A similar view was shared by All Thread Industries, who cited that monopoles require less land per tower, with fewer components, also resulting in faster construction and lower costs.[300]For further information on evidence associated with concerns relating to visual amenity by the HumeLink and Central-West Orana REZ projects, refer to chapter three of the prior Standing Committee report.[301]

Community mental health

3.160 Mental health concerns were raised in submissions to the committee by impacted landowners and community members, in relation to the HumeLink and Central-West Orana REZ projects.

293 Submission 27, CWO REZist, p 9.

294 Submission 77, Mr Kingwill, p 1.

295 Submission 73, ReD4NE Inc, p 6.

296 Evidence, Ms Gerrard, 27 November 2023, p 26.

297 Submission 31, Iberdrola Australia, p 5.

298 Evidence, Mr de Wild, 16 February 2024, p 13.

299 Evidence, Ms Kean, 27 November 2023. P 18.

300 Submission 56, All Thread Industries, p 1.

301 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 39-52.

3.161 One landowner impacted by the Central-West Orana project reported that he was understanding of the fact that the world is emerging from traditional coal mining approaches to meet energy generation requirements.[302] However, he did not understand why agricultural land was being disturbed and advocated that the development of the project was incredibly upsetting, with locals within the impacted area not wanting the development.[303]

3.162 When referring to the HumeLink project, community member Mrs Rosemary Miller told the committee that the environmental impacts and limitations on landholders being able to use their farmland would likely have mental health impacts.[304]

3.163 Mr Greg McGrath, an impacted landowner from the Yass area, shared a similar view and claimed that the anxiety and stress this project has caused his family was immense.[305] Mr McGrath added that it 'has taken moments from us that we will never get back'.[306] Community member, Mr Bill Kingwill shared a similar opinion, noting that there has been a substantial impact on the mental health of landowners.[307]

3.164 For further information on impacts to community and landholder and community wellbeing, refer to chapter two of the prior Standing Committee report.[308]

Committee comment

3.165 The intention of this committee was to gain a balanced and considered view of the costs and benefits of both overgrounding and undergrounding electricity transmission infrastructure. However, the limited uptake of undergrounding technology in Australia, along the lines of that envisioned by those who are advocating for HumeLink to be undergrounded, made the task difficult.

3.166 The release of the Amplitude report following the tabling of the first inquiry report challenged many of the costings relied on to initially justify the overgrounding of the HumeLink infrastructure. Furthermore, Transgrid's evidence in the first inquiry that there was a 30 per cent increase in the initial stated project cost, from $3.3 billion to $5 billion adds weight to the calls from some witnesses for the HumeLink to be resubmitted in the RIT-T. The committee notes Transgrid's evidence that the Amplitude report costs a different scope, with lower capacity, to what is proposed for Humelink. The committee also notes that the available evidence does seem to support the fact that undergrounding electricity transmission infrastructure is more costly, however the question remains as to by how much more. 'One of the issues the committee encountered with respect to determining the cost differential was competing evidence about whether the same project, with the same specifications, had been costed.

302 Submission 45, Name suppressed, p 1.

303 Submission 45, Name suppressed, p 1.

304 Submission 6, Mrs Rosemary Miller, p 4.

305 Submission 52, Mr Greg McGrath, p 5.

306 Submission 52, Mr McGrath, p 5.

307 Submission 77, Mr Bill Kingwill, p 2.

308 Standing Committee on State Development, NSW Legislative Council, *Feasibility of undergrounding the transmission infrastructure for renewable energy projects* (2023), pp 26-27.

3.167 The committee also notes concerns from some stakeholders that the cost of undergrounding electricity transmission projects will negatively impact the price of electricity to consumers through flow-on costs. We are of the view that the cost of building the transmission infrastructure necessary for the switch to renewable energy should not be borne solely by the consumer. We call on the NSW Government to consider regulatory reform that will ensure a fairer sharing of the financial cost of electricity transmission infrastructure, so that it is not solely borne by the consumer.

Recommendation 3

That the NSW Government consider regulatory reform that will ensure a fairer sharing of the financial cost of electricity transmission infrastructure, so that it is not solely borne by the consumer.

3.168 Other stakeholders suggested that switching to undergrounding, particularly in the case of HumeLink, will cause unacceptable delays for a project that needs to be completed as soon as possible, in order for the State to meet its commitments to net zero by 2050. These stakeholders, including most environmental groups, have urged the committee not to favour underground transmission lines over overhead because it risks delaying the uptake of renewable energy. Overhead transmission lines, as the cheaper and quicker option, they argue, should therefore be the preferred approach.

3.169 Notwithstanding the need to have the infrastructure in place in a timely manner to meet State and Commonwealth Government strategies and climate change targets, the current cost and benefit assessment component of regulatory tests are currently weighted in favour over overhead lines. Whilst we accept that overhead transmission lines are the desired solution in many situations, we believe that the role that underground transmission infrastructure could play for the transmission network rollout is still too readily dismissed. The committee believes that non-economic factors should also be considered, including the impact on communities and landholders, particularly with the need to build a resilient electricity transmission infrastructure network that is better able to withstand extreme weather events, including bushfires, to ensure the security and stability of the transmission network in New South Wales in decades to come.

3.170 Regarding resilient electricity infrastructure, the committee was encouraged to hear that Ausgrid had been proactive in terms of climate risk planning with its completion of a climate risk forecast out to 2090 which supported their submission to the AER for five years of Commonwealth funding to assist with building the resilience of their infrastructure to climate change. The committee also notes that Transgrid stated that they too have developed a resiliency plan. However, the committee believes that more should be done in this regard to require energy providers to develop and implement climate adaptation plans for their infrastructure. Therefore, the NSW Government should work with the Commonwealth Government to ensure that electricity transmission providers develop climate adaptation plans for their energy infrastructure to ensure that the state's energy transmission networks are built with the resilience to withstand more frequent and extreme weather events.

Recommendation 4

That the NSW Government work with the Commonwealth Government to ensure that electricity transmission providers develop climate adaptation plans for their energy infrastructure to ensure that the State's energy transmission networks are built with the resilience to withstand more frequent and extreme weather events.

3.171 Moreover, it seems that the appeal of upfront lower costs associated with traditional overhead AC power lines may deter transmission providers and infrastructure planners from investing in crucial newer technologies to support the demand for electricity. We believe there is an urgent need to develop and grow Australia's capacity, expertise and workforce in underground transmission lines, including the domestic manufacture of transmission lines and ensuring that the supply of transmission lines can be guaranteed through the global supply chain. We urge the NSW Government to commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology, the existing capacity of the domestic workforce and industry and the requirements for a domestic manufacturing industry.

Recommendation 5

That the NSW Government commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology, the existing capacity of the domestic workforce and industry and the requirements for a domestic manufacturing industry.

3.172 One idea we sought to understand further was the viability of a hybrid approach; that is, a transmission project built using overground and underground technology at different points of the project. This approach could be a way to allow the benefits of both technologies to be harnessed – for example, where sensitivities occur, such as potential visual or agricultural impacts, or bushfire risk. The committee acknowledges that the immediacy with which new transmission lines needs to be built necessitates that the least expensive and faster technology of overheating needs to remain part of the mix for transmission builds at least for current projects.

3.173 The committee is of the view that a hybrid approach, where underground transmission lines are chosen for parts of the length of a project has merit. The committee believes that if Transgrid and EnergyCo were to do this it may assist in building social licence for current and future energy transmission projects. To this end, we recommend that the NSW Government work with Transgrid and EnergyCo consider opportunities for a 'hybrid' approach for transmission infrastructure projects, including exploring ways to better support the use of undergrounded transmission, to address sensitivities wherever practicable.

Recommendation 6

That the NSW Government work with Transgrid and EnergyCo to:

- consider opportunities for a 'hybrid' approach for transmission infrastructure projects, and
- explore ways to better support the use of undergrounded transmission, to address sensitivities wherever practicable.

3.174 Regarding both environmental impacts and social licence, the committee was pleased to hear that Transgrid has re-routed some areas of the HumeLink project to address community concerns regarding protection to bushland as well as culturally sensitive areas. However, we acknowledge that community concern remains about the impact of overhead electricity infrastructure on agricultural land, particularly on farming activities and the broader community. It is clear that the HumeLink and Central-West Orana REZ projects pose concerns to many communities in New South Wales and more could have been done to bring the community onside in future infrastructure projects.

3.175 The committee acknowledges that Transgrid has also adopted recent recommendations, including the improvement of community engagement approaches. As noted in chapter two, the National Energy Rules have been amended to include requirements for community consultation. The committee strongly encourages the New South Wales Government to monitor community and social impact outcomes from communities affected by the planning, proposal and delivery of ISP projects.

3.176 In this regard, we also commend the improved community consultation efforts of Ausgrid and were pleased to hear of the maturity of its community engagement practices. The committee notes that EnergyCo is not a member of the Energy Charter and therefore it is not bound by the Better Practice Social Licence Guideline, which has been identified as a positive driver of improved community consultation and stronger social licence outcomes and appears to us to be a clear opportunity for EnergyCo to ensure it engages more genuinely with the community.

Recommendation 7

That, in order to improve community engagement practices and social licence around renewable energy transmission projects, EnergyCo look for ways to further enhance its relationship with the Energy Charter.

3.177 Finally, the committee notes evidence by Monash University researchers that most past social research with households indicates they prefer the undergrounding of distribution and transmission lines, but this may change when they understand the costs, disruption impacts and potential risks. Social research is needed to engage people in conversations about the options, opportunities and constraints of undergrounding transmission lines in the context of the broader energy vision and purpose for expanding the transmission network. However, it is clear that for these projects, more information is needed to adequately explain to the community the options, opportunities and constraints of undergrounding transmission lines versus overhead transmission lines in the broader context of the NSW Government's legislated Net Zero and

renewable energy targets. To improve the approach for future projects, we call on the NSW Government work with the Commonwealth Government to develop and implement a plan to ensure the community is genuinely engaged around transitioning our electricity infrastructure to renewable energy, including the costs, benefits and opportunities of new energy infrastructure required to achieve the Government's net zero goals. We also recommend that the NSW Government ensure appropriate information about the need for infrastructure, and the costs and benefits of undergrounding compared to overheading, is made available to the public to support informed discourse on the topic.

Finding 2

That more information is needed to adequately explain to the community the options, opportunities and constraints of undergrounding transmission lines versus overhead transmission lines in the broader context of the NSW Government's legislated Net Zero and renewable energy targets.

Recommendation 8

That the NSW Government work with the Commonwealth Government to develop and implement a plan to ensure the community is genuinely engaged around transitioning our electricity infrastructure to renewable energy, including the costs, benefits and opportunities of new energy infrastructure required to achieve the Government's net zero goals.

Recommendation 9

That the NSW Government ensure appropriate information about the need for infrastructure, and the costs and benefits of undergrounding compared to overheading, is made available to the public to support informed discourse on the topic.

Appendix 1 Submissions

No.	Author	Attachments
1	Owen & Cheryl Smith	
2	Mr James Beale	
3	Hon Wendy Tuckerman MP	
4	Mrs Tanya Kline	
5	Mr David Bowman	
6	Mrs Rosemary Miller	
6a	Mrs Rosemary Miller	
7	Mr Ken Barber	
8	Gawain Bowman	
9	Mr John Gormly	
10	Name suppressed	1
11	The Energy Charter	
12	HumeLink Alliance Incorporated	4
12a	HumeLink Alliance Incorporated	4
12b	HumeLink Alliance Incorporated	
13	Professor Peta Ashworth	
14	Dr Joe McGirr MP	
15	Name suppressed	2
16	Name suppressed	2
17	Name suppressed	5
18	Ms Jennifer Bowman	
19	Mrs Helen Howell	
20	Goulburn Mulwaree Council	
21	Frances Bowman	
22	Karen and Thomas Appel	
23	Mrs Sally Edwards	4
24	Upper Lachlan Landcare	
25	Farmers for Climate Action	1
26	Ausgrid	
27	CWO REZist Inc.	
28	National Parks Association of NSW	

No.	Author	Attachments
29	Energy Users' Association of Australia	
30	Specialist Utility Infrastructure	3
31	Iberdrola Australia Networks	1
32	Business NSW.	
33	Clean Energy Investor Group (CEIG)	
34	Energy Networks Australia	
35	Energy Corporation of NSW	
36	NSW Farmers Upper Lachlan Branch	
37	NSW Farmers Yass Branch	
38	Softwoods Working Group	
39	Nexa Advisory	
40	GMR Energy	
41	Stride Renewables	
42	Nature Conservation Council	
43	Hon Angus Taylor MP	
44	Miss Emma Bowman	
45	Name suppressed	
46	Name suppressed	
47	Name suppressed	
48	Name suppressed	
49	Name suppressed	2
50	Name suppressed	
51	Mrs Rebecca Tobin	
51a	Mrs Rebecca Tobin	
52	Mr Greg McGrath	
53	Mr Les Brand	
54	Mr Michael Katz	2
55	DNV	
56	All Thread Industries	
57	Snowy Valleys Council	
58	Mr Ben Phillips	
59	Ms Robin Quilty	
60	Mrs Catherine Kelly	
61	Shana Nerenberg	

No.	Author	Attachments
62	Mr Roger McLennan	
63	Name suppressed	
64	Renate Lunardello	8
65	Jeff Hudson	
66	Mr Peter Lawson	1
67	Russ Erwin	
68	NSW Farmers Dunedoo Branch	
69	Michael Kingwill	
70	Andrew Reynolds	
71	Grant Piper	4
72	Jessie Reynolds	
73	ReD4NE Inc.	1
74	Mr Mark Lucas	6
75	Name suppressed	3
76	Mr John McGrath	1
76a	Mr John McGrath	
76b	Mr John McGrath	
77	Bill Kingwill	
78	Name suppressed	
79	Iain	
80	Lynette LaBlack	8
80a	Lynette LaBlack	
81	Monash Energy Institute, Monash University	1

Appendix 2 Witnesses

Date	Name	Position and Organisation
Monday 27 November 2023 Preston Stanley Room Parliament House, Sydney	Mr Les Brand	Managing Director, Amplitude Consultants
	Mr Grant Piper *(via videoconference)*	Deputy Chair, CWO REZist Inc
	Mr Simon Corbell	CEO and Chairperson, Clean Energy Investor Group
	Ms Amy Kean	Director, Stride Renewables
	Ms Heidi McElnea *(via videoconference)*	Engagement Coordinator, Community Power Agency
	Ms Elianor Gerard	Engagement Coordinator, Community Power Agency
	Mr Andrew Bray *(via videoconference)*	National Director, RE-Alliance
	Mr Leigh Heaney	Manager Government Relations, Smart Energy Council
	Mr Connor Woulfe	Policy, Legal and Research Adviser, Smart Energy Council
	Mr James Hay	Chief Executive Officer, Energy Corporation of NSW (EnergyCo)
	Mr Andrew Kingsmill	Executive Director, Network Planning & Technical Advisory, Energy Corporation of NSW (EnergyCo)
Friday 16 February 2024 Macquarie Room Parliament House, Sydney	Mr Jim Cox	Deputy Chair, Australian Energy Regulator (AER)
	Mr Frank de Wild *(via videoconference)*	Business Director & Senior Principal Consultant, DNV

Date	Name	Position and Organisation
	Associate Professor Roger Dargaville *(via videoconference)*	Monash Energy Institute Interim Director and Senior Lecturer, Civil Engineering, Monash University
	Professor Yolande Strengers *(via videoconference)*	Associate Dean (Equity, Diversity & Inclusion), Faculty of IT, Monash University
	Mr Dominic Adams	General Manager – Networks, Energy Networks Australia
	Mr Ricardo da Silva Alvarez	Network Development Business Manager, Iberdrola Australia
	Mr Nino Lalic	General Manager Public Affairs, Iberdrola Australia
	Mr James Hay	Chief Executive Officer, Energy Corporation of NSW (EnergyCo)
	Mr Andrew Kingsmill	Executive Director, Network Planning & Technical Advisory, Energy Corporation of NSW (EnergyCo)
	Mr Junayd Hollis	Group Executive – Customer, Assets & Digital, Ausgrid
	Ms Marie Jordan	Executive General Manager of Network, Transgrid
	Mr Jeremy Roberts	Major Project Delivery Director, Transgrid

Appendix 3 Minutes

Minutes no. 1
Friday, 22 September 2023
Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects
Room 1043, Parliament House, Sydney, 1.15pm

1. Members present
Ms Faehrmann
Mr Fang
Mr Buttigieg
Mrs Carter
Mr Lawrence
Ms Suvaal (from 1.17 pm)

2. Apologies
Mr Roberts

3. Correspondence
The committee noted the following items of correspondence:

Received

- 15 September 2023 – Letter from the Hon Sam Farraway MLC to the Chair, requesting the committee visit the Central West / Orana region as part of the inquiry.

4. Tabling of the resolution establishing the committee
The Committee Clerk tabled the resolution of the House of 13 September 2023, establishing the committee, which reads as follows:

1. That a select committee be established to inquire into and report on the feasibility of undergrounding the transmission infrastructure for renewable energy projects, and in particular:
   (a) the costs, benefits and risks of underground versus overhead transmission lines, particularly with regard to bushfire and other weather-related events, ongoing environmental impacts, and community mental health and welfare,
   (b) existing case studies and current projects regarding similar undergrounding of transmission lines in both domestic and international contexts,
   (c) any impact on delivery timeframes of undergrounding with broad community consensus versus overhead transmission with large scale opposition, and
   (d) any other related matters.
2. That, notwithstanding anything to the contrary in the standing orders, the committee consist of seven members comprising:
   (a) three Government members,
   (b) two Opposition members, one being Mr Fang, and
   (c) two Crossbench members, being Ms Faehrmann and Mr Roberts.
3. That the Chair of the committee be Ms Faehrmann and the Deputy Chair be Mr Fang.

4. That, unless the committee decides otherwise:

(a) all inquiries are to be advertised via social media, stakeholder emails and a media release distributed to all media outlets in New South Wales,

(b) submissions to inquiries are to be published, subject to the Committee Clerk checking for confidentiality and adverse mention and, where those issues arise, bringing them to the attention of the committee for consideration,

(c) attachments to submissions are to remain confidential,

(d) the Chair's proposed witness list is to be circulated to provide members with an opportunity to amend the list, with the witness list agreed to by email, unless a member requests the Chair to convene a meeting to resolve any disagreement,

(e) the sequence of questions to be asked at hearings alternate between Opposition, Crossbench and Government members, in that order, with equal time allocated to each,

(f) transcripts of evidence taken at public hearings are to be published,

(g) supplementary questions are to be lodged with the Committee Clerk within two business days following the receipt of the hearing transcript, with witnesses requested to return answers to questions on notice and supplementary questions within 21 calendar days of the date on which questions are forwarded to the witness,

(h) answers to questions on notice and supplementary questions are to be published, subject to the Committee Clerk checking for confidentiality and adverse mention and, where those issues arise, bringing them to the attention of the committee for consideration, and

(i) media statements on behalf of the committee are to be made only by the Chair.

5. That the committee report by 31 March 2024.

5. Conduct of committee proceedings

The committee noted the Broadcast of Proceedings resolution (as amended by the Legislative Council on 19 October 2022), in particular the provisions relating to the filming, broadcasting, rebroadcasting and photography of committee proceedings, including:

4) That unless resolved otherwise by a committee, this House authorises:

(a) the filming, broadcasting and photography of members and witnesses in committee proceedings:

(i) by representatives of media organisations, including from around the committee meeting table,

(ii) by any member of the public, from the position of the audience, and

(b) the rebroadcasting of committee proceedings on the Legislative Council and Parliament's social media channels.

6. Conduct of inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects

6.1 Referral of evidence from State Development Committee inquiry into undergrounding

Resolved, on the motion of Mr Fang: That the Chair move a motion in the House to have the evidence from the Standing Committee on State Development inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects referred to the Select Committee to form part of its evidence for the current inquiry.

6.2 Closing date for submissions

Resolved, on the motion of Mr Fang: That:

- submissions are called once the House refers the evidence from the Standing Committee on State Development inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects to the committee
- when calling for submissions, stakeholders are advised that any evidence previously given to the State Development inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects has been referred to the committee, and that the website be updated to reflect this arrangement
- the closing date for submissions be Friday, 10 November 2023.

6.3 Stakeholder list

Resolved, on the motion of Mrs Carter: That:

- the secretariat circulate to members the Chair's proposed list of stakeholders to be invited to make a submission, which will include the original stakeholder list and all inquiry participants (ie. submission authors, witnesses, site visit participants) from the State Development inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects
- members have two days from when the Chair's proposed list is circulated to make amendments or nominate additional stakeholders
- the committee agree to the stakeholder list by email, unless a meeting of the committee is required to resolve any disagreement.

6.4 Approach to submissions

Resolved, on the motion of Mr Fang: That, to enable significant efficiencies for members and the secretariat while maintaining the integrity of how submissions are treated, in the event that 50 or more individual submissions are received, the committee may adopt the following approach to processing short submissions:

- All submissions from individuals 250 words or less in length will:
  - have an individual submission number, and be published with the author's name or as name suppressed, or kept confidential, according to the author's request
  - be reviewed by the secretariat for adverse mention and sensitive/identifying information, in accordance with practice
  - be channelled into one single document to be published on the inquiry website
- All other submissions will be processed and published as normal.

6.5 Hearing dates and site visits

Resolved, on the motion of Mrs Carter: That the committee:

- conduct one hearing in Sydney on Monday 27 November
- conduct two further committee activities early next year, to be decided following the receipt of submissions, the dates of which are to be determined by the Chair after consultation with members regarding their availability.

7. Adjournment

The committee adjourned at 1.24 pm, *sine die*.

David Rodwell

Committee Clerk

Minutes no. 2
Friday 24 November 2023
Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects
Room 1043, Parliament House, Sydney at 11.01 am

1. Members present

Ms Faehrmann, *Chair*
Mr Fang, *Deputy Chair*
Mr Buttigieg
Mrs Carter
Mr Lawrence (via videoconference)
Mr Roberts
Ms Suvaal

2. Proposed witnesses

The committee noted that the secretariat has invited the following witnesses via email invitation to the hearing on Monday 27 November:

- DNV
- Witness A / Witness B
- CWO REZist Inc
- Clean Energy Investor Group
- Stride Renewables
- Energy Grid Alliance
- Professor Peta Ashworth
- Macroplan
- Community Power Agency
- Re-Alliance
- Smart Energy Council
- Energy Corporation of NSW (EnergyCo)

Mr Fang moved: That Amplitude Consultants be invited to the hearing on Monday 27 November.

Question put.

The committee divided.

Ayes: Mrs Carter, Ms Faehrmann, Mr Fang and Mr Roberts.

Noes: Mr Buttigieg, Mr Lawrence and Ms Suvaal.

Question resolved in the affirmative.

Ms Suvaal moved: That Amplitude Consultants appear at the hearing for a total of forty-five minutes on Monday 27 November.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence and Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang and Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That Mr Sheejan Pandey and Associate Professor Roger Dargaville from Monash University (Monash Energy Institute) be invited to the hearing on Monday 27 November.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence and Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang and Mr Roberts.

Question resolved in the negative.

Mr Roberts moved: That the hearing schedule for Monday 27 November be adopted and published.

Question put.

The committee divided.

Ayes: Mrs Carter, Ms Faehrmann, Mr Fang and Mr Roberts.

Noes: Mr Buttigieg, Mr Lawrence and Ms Suvaal.

Question resolved in the affirmative.

3. Adjournment

The Committee adjourned at 11.20 am until Monday 27 November 2023 (committee hearing – inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects).

Daniel Whiteman
Committee Clerk

Minutes no. 3
Monday 27 November 2023
Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects
Preston Stanley Room, Parliament House, Sydney at 8.48 am

1. Members present

Ms Faehrmann, *Chair*
Mr Fang, *Deputy Chair,* from 9.13 am
Mr Buttigieg, until 12.35 pm and from 3.47 pm
Ms Carter
Mr Lawrence
Mr Roberts
Ms Suvaal

2. Apologies

3. Previous minutes

Resolved, on the motion of Mrs Carter: That the draft minutes no 1 be confirmed.

4. Correspondence

The committee noted the following items of correspondence:

Received

- 10 October 2023 – Email from Mr Leigh Heaney, Government Relations Manager, Smart Energy Council, to the secretariat, requesting to attend as a witness at the scheduled hearing on 27 November 2023.

- 7 November 20223 – Email from Ms Rebecca Tobin, community representative, HumeLink United, to the secretariat, regarding the referral of evidence from the Committee for Social Issues, including the recording of community speeches made at the public forum held in Tumut.
- 22 November 2023 – Email from Mr Farren Edwards, Director, Energy Grid Alliance, to the secretariat, advising Energy Grid Alliance is unable to attend the public hearing on Monday 27 November 2023.
- 22 November 2023 – Email from Professor Peta Ashworth, Director, Institute for Energy Transition, Curtin University, to the secretariat, advising that she is unable to attend the public hearing on Monday 27 November 2023.

5. Referral of evidence from the previous inquiry

The committee noted that as per the resolution made in the House on 11 October 2023, copies of the minutes of proceedings, transcripts of evidence, tabled documents, submissions, correspondence, and answers to questions on notice and supplementary questions received by the Standing Committee on State Development during its 2023 inquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects were referred to the Select Committee on the feasibility of undergrounding the transmission infrastructure for renewable energy projects.

6. Submissions

6.1 Public submissions

The committee noted that the that the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submission nos. 1-9, 11-14, 18-29, 31-44 and 51-57

Resolved, on the motion of Mr Roberts: That the committee authorise the publication of submission nos. 58-74, 76-77 and 79-80a.

6.2 Partially confidential submissions

Resolved, on the motion of Mr Roberts: That the committee keep the following information confidential, as per the requires of the author: names in submission nos. 10, 15-17, and 45-50.

Resolved, on the motion of Mr Roberts: That the committee authorise the publication of submission nos. 75 and 78, with the exception of identifying information which is to remain confidential, as per the request of the authors.

Resolved, on the motion of Mr Roberts: That the committee authorise the publication of submission no. 30, with the exception of sensitive information which is to remain confidential, as per the request of the author.

6.3 Attachments

Resolved, on the motion of Mr Roberts: That the committee authorise the publication of the following attachments to submissions:

- Submission 12, Attachment 2 – Report by Stop, Rethink HumeLink entitled 'Undergrounding Transmission: The Best Option'.
- Submission 30, Attachment A – Report by Amplitude Consultants entitled 'HumeLink Undergrounding, Review of Transgrid Report and Costing of HVDC Alternatives'.
- Submission 30, Attachment B – Report by GHD entitled 'Concept Design and Cost Estimate. HumeLink Project Underground'.
- Submission 31 – Report by Iberdrola Australia entitled 'Feasibility of Undergrounding Transmission Lines'.

7. Sequence of questions

Resolved, on the motion of Ms Suvaal: That the sequence of questions asked at the hearing to alternate between opposition, crossbench and government members, in that order with equal time allocated to each.

8. Public Hearing

The public and the media were admitted at 9.00 am.

The first witness was unavailable.

The committee adjourned at 9.13 am.

The public and media withdrew.

The public and the media were readmitted at 9.45 am.

The committee proceeded to take *in camera* evidence.

Persons present other than the committee: Laura Ismay, Daniel Whiteman, Gareth Perkins, Reeti Pandharipande, audio-visual broadcast operators and Hansard reporters.

The evidence concluded and the witness withdrew.

The public and the media were readmitted.

The following witnesses was sworn and examined:

- Mr Les Brand, Amplitude Consultants.

The evidence concluded and the witness withdrew.

The following witness were sworn and examined:

- Mr Simon Corbell, Clean Energy Investor Group.
- Ms Amy Kean, Stride Renewables

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Ms Heidi McElnea, Community Power Agency
- Ms Elianor Gerard, Community Power Agency
- Mr Andrew Bray, RE-Alliance
- Mr Leigh Heaney, Smart Energy Council
- Mr Connor Woulfe, Smart Energy Council

The evidence concluded and the witnesses withdrew.

The following witness were sworn and examined:

- Mr James Hay, EnergyCo.
- Mr Andrew Kingsmill, EnergyCo.

The evidence concluded and the witnesses withdrew.

9. Committee activity for 2024

The committee noted that it previously resolved to conduct two further committee activities in early 2024, including one regional site visit to the Central West and Orana region.

Mr Fang moved: That the committee conduct a site visit to the Central West Orana region REZ on Friday 16 February 2024.

Question put.

The committee divided.

Ayes: Mrs Carter, Mr Fang and Mr Roberts.

Noes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence and Ms Suvaal.

Question resolved in the negative.

Ms Suvaal moved: That the committee hold the public hearing on Friday 16 February 2024 at Parliament House.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence and Ms Suvaal.

Noes: Mrs Carter, Mr Fang and Mr Roberts.

Question resolved in the affirmative.

10. Adjournment

The committee adjourned at 3.54 pm until Friday 16 February 2024 (second hearing of the inquiry on the feasibility of undergrounding the infrastructure for renewable energy projects).

Daniel Whiteman
Committee Clerk

Minutes no. 4
Friday 16 February 2024
Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects
Macquarie Room, Parliament House, Sydney at 8.47 am

1. Members present

Ms Faehrmann, *Chair*
Mr Fang, *Deputy Chair*
Mr Buttigieg
Ms Carter, until 3.20 pm and from 4.07 pm
Mr Lawrence, until 8.51 am
Ms Suvaal

2. Apologies

Mr Roberts

3. Previous minutes

Resolved, on the motion of Mr Fang: That draft minutes nos 2 and 3 be confirmed.

4. Correspondence

The committee noted the following items of correspondence:

Received

- 11 December 2023 – Email from Mr Andrew Bray, National Director, Re-Alliance to the secretariat, providing further detail to the committee and requesting corrections to the transcript from the public hearing on 27 November 2023.

- 15 December 2023 – Email from Ms Emma Ashton, Senior Manager, Government and Stakeholder Relations, TransGrid, providing a response to a submission provided by Amplitude Consultants.
- 8 January 2024 – Email from Mr Andrew Kingsmill, Executive Director Network Planning & Technical Advisory, Energy Corporation of NSW (EnergyCo), to the secretariat, requesting corrections to the transcript from the public hearing on 27 November 2023.
- 25 January 2024 – Email from Ms Sabiene Heindl, Chief Executive Officer, The Energy Charter, to the secretariat, advising that The Energy Charter is unable to attend the public hearing on Friday 16 February 2024.
- 29 January 2024 – Email from Professor Peta Ashworth, Director, Curtin Institute for Energy Transition, to the secretariat, advising that Curtin Institute for Energy Transition is unable to attend the public hearing on Friday 16 February 2024.
- 5 February 2024 – Email from Mr Dominic Kelly, Manager Policy and Government Affairs Australian Energy Market Operator (AEMO), to the secretariat, declining the invitation for AEMO to attend the public hearing on Friday 16 February 2024.

5. Submissions

5.1 Public submissions

The committee noted that the that the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submission no. 81.

5.2 Partially confidential submission

Resolved, on the motion of Ms Suvaal: That the committee keep the information confidential, as per the request of the submission author: names and identifying information in submission no 63.

5.3 Attachment

Resolved, on the motion of Ms Suvaal: That the committee publish Attachment 1 to submission 81, entitled 'Report by Monash Energy Institute (Monash University) - Preliminary MUREIL Modelling Results, Overhead vs. Underground Transmission'.

5.4 Answers to questions on notice and supplementary questions

Resolved, on the motion of Mrs Carter: That:

- the committee authorise the insertion of a footnote on page 27 of the transcript from the 27 November 2023 hearing, clarifying the evidence of Mr Bray, as per the correspondence received 11 December 2023
- the committee authorise the insertion of three footnotes on page 33 of the transcript from the 27 November 2023 hearing, clarifying the evidence of Mr Kingsmill, as per the correspondence received 8 January 2024.

6. Sequence of questions

Resolved, on the motion of Mr Fang: That the sequence of questions asked at the hearing to alternate between opposition, crossbench and government members, in that order with equal time allocated to each.

7. Public Hearing

The public and the media were admitted at 9.00 am.

The following witness was sworn and examined:

- Mr Jim Cox, Australian Energy Regulator (AER)

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:

- Mr Frank de Wild, DNV (via videconference).

The evidence concluded and the witness withdrew.

The following witnesses were sworn and examined:
- Associate Professor Roger Dargaville, Monash University (via videconference).
- Professor Yolande Strengers, Monash University (via videconference).

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:
- Mr Dominic Adams, Energy Networks Australia
- Mr Ricardo da Silva Alvarez, Iberdrola Australia
- Mr Nino Lalic, Iberdrola Australia

The evidence concluded and the witnesses withdrew.

The following witnesses were examined on their former oath:
- Mr James Hay, EnergyCo.
- Mr Andrew Kingsmill, EnergyCo.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Mr Junayd Hollis, Ausgrid

The evidence concluded and the witness withdrew.

The following witnesses were sworn and examined:
- Ms Marie Jordan, Transgrid
- Mr Jeremy Roberts, Transgrid

The evidence concluded and the witnesses withdrew.

The public hearing concluded at 4.15 pm. The public and media withdrew.

8. Other Business

Tendered documents

Resolved, on the motion of Mr Fang: That the committee accept and publish the following document tendered during the public hearing, subject to the secretariat contacting the recipient of the document for permission and redactions of personal information being made:

- Proposed land acquisition notice to commence the compulsory acquisition process for the Central-West Orana renewable energy transmission project.

Answers to question on notice

Resolved, on the motion of Mr Fang: That witnesses be requested to return answers to questions on notice, answers to supplementary questions and transcript corrections within 14 days of the date on which questions are forwarded to the witnesses by the committee clerk.

9. Adjournment

The committee adjourned at 4.18 pm until 9.30 am Friday 25 March 2024 (report deliberative).

Daniel Whiteman
Committee Clerk

Draft minutes no. 5
Monday 25 March 2024

Select Committee on the Feasibility of Undergrounding the Transmission Infrastructure for Renewable Energy Projects
Room 1043, Parliament House, Sydney at 9.30 am

1. Members present

Ms Faehrmann, *Chair*
Mr Fang, *Deputy Chair* (via videoconference)
Mr Buttigieg
Ms Carter,
Mr Lawrence (via videoconference)
Mr Roberts
Ms Suvaal

2. Previous minutes

Resolved, on the motion of Mr Roberts: That draft minutes no. 4 be confirmed.

3. Correspondence

The committee noted the following items of correspondence:

Received

- 23 February 2024 – Email from Mr Dominic Adams, General Manager - Networks, Energy Networks Australia to the secretariat, requesting corrections to the transcript from the public hearing on 16 February 2024.
- 2 March 2024 – Email from Mr Frank de Wild, Business Director & Senior Principal Consultant – Power Cables, DNV, to the secretariat, requesting corrections to the transcript from the public hearing on 16 February 2024.
- 6 March 2024 – Email from Mr Andrew Kingsmill, Executive Director Network Planning & Technical Advisory, Energy Corporation of NSW (EnergyCo), to the secretariat, requesting corrections to the transcript from the public hearing on 16 February 2024
- 26 March 2024 – Email from Andrea Strong, HumeLink Alliance Inc, providing additional information regarding her second supplementary submission

4. Answers to questions on notice

The committee noted that answers to questions on notice were published by the committee clerk under authorisation of the resolution forming the committee:

- Ausgrid, received on 6 March 2024
- Energy Commission of New South Wales (EnergyCo), received on 6 March.
- Transgrid, received on 7 March 2024.

5. Transcript corrections

Resolved, on the motion of Mr Buttigieg: That:

- the committee authorise the insertion of two footnotes on pages 23 and 26 of the transcript from the 16 February 2024 hearing, clarifying the evidence of Mr Adams, as per the correspondence received 23 February 2024
- the committee authorise the insertion of footnotes on pages 10, 12, and 13 of the transcript from the 16 February 2024 hearing, clarifying the evidence of Mr de Wild, as per the correspondence received 2 March 2024
- the committee authorise the insertion of a footnote on page 36 of the transcript from the 16 February 2024 hearing, clarifying the evidence of Mr Kingsmill, as per the correspondence received 6 March 2024.

6. Consideration of the Chair's report

Consideration of the Chair's report, entitled 'Feasibility of undergrounding the transmission infrastructure for renewable energy projects'.

Resolved, on the motion of Ms Suvaal: That the first introductory paragraph in Chapter 1 be amended by omitting 'the national requirement to increase capacity within the National Electricity Market (NEM)' and inserting instead 'the need for additional network capacity to connect renewable energy projects as coal-fired power stations reach end-of-live'.

Ms Suvaal moved: That the second introductory paragraph in chapter 1 be amended by omitting: 'This is despite the known difficulty in obtaining insights on the topic of undergrounded infrastructure within Australia.'

Mr Roberts moved: That the motion of Ms Suvaal be amended by omitting 'This is despite the known difficulty in obtaining insights on the topic of undergrounded infrastructure within Australia' and inserting instead 'This is despite the difficulty experienced by the committee in obtaining insights on the topic of undergrounded infrastructure within Australia.'

Amendment of Mr Roberts put and passed.

Original question of Ms Suvaal, as amended, put and passed.

Resolved, on the motion of Ms Suvaal: That paragraph 1.1 be amended by inserting 'Minister for Climate Change' before 'Minister for Energy'.

Ms Suvaal moved: That paragraph 1.2 be omitted: 'On 31 August 2023, the NSW Premier announced the electricity transmission infrastructure of the HumeLink project, connecting Renewable Energy Zone (REZ) to the NEM, would proceed utilising overhead transmission lines. Cited reasoning for the decision noted 'extensive increasing costs for energy prices in NSW'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Ms Faehrmann, Mr Fang, Mrs Carter, Mr Roberts

Question resolved in the negative.

Resolved, on the motion of Mr Roberts: That paragraph 1.2 be amended by omitting 'announced' before 'the electricity transmission infrastructure of the HumeLink project' and inserting instead confirmed' before 'the electricity transmission infrastructure of the HumeLink project.'

Ms Suvaal moved: That paragraph 1.3 be amended by omitting: 'The first inquiry report was tabled on the same day.'

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Ms Faehrmann, Mr Fang, Mrs Carter, Mr Roberts

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That the following new paragraph be inserted after paragraph 1.19: 'These regulatory changes are not directly related to the issue of undergrounding.'

Resolved, on the motion of Ms Suvaal: That paragraph 2.6 be amended by inserting 'replace NSW's ageing coal-fired power stations to ensure a reliable supply of affordable energy and' before 'achieving the target zero net emissions by 2050.'

Resolved, on the motion of Ms Suvaal: That paragraph 2.7 be amended by omitting 'electricity infrastructure' and inserting instead 'transmission infrastructure' after 'including generators; storage, including batteries and pumped hydro; and high voltage'.

Resolved, on the motion of Ms Suvaal: That paragraph 2.9 be amended by omitting 'Through its Network Infrastructure Strategy, EnergyCo has committed' and inserting instead 'Through the *Electricity Infrastructure Investment Act,* the NSW Parliament has committed'.

Resolved, on the motion of Ms Suvaal: That paragraph 2.11 be amended by omitting 'will' and inserting instead 'may' after 'The REZ areas in New South Wales'.

Resolved on the motion of Ms Suvaal: That:

a) paragraph 2.20 be omitted: 'For example, Ms Kean, Managing Director, Stride Renewables, expressed the view that the RIT-T test's overwhelming focus on the cost of a project in assessing its credibility was coming at the expense of other key factors, such as environmental and social considerations:

> I think the RIT-T process has some fundamental challenges associated with it. It is very much focused on the least cost, which you raised before, and doesn't consider the environmental or social impact'

b) paragraph 2.24 be amended by inserting 'I think the RIT-T process has some fundamental challenges associated with it. It is very much focused on the least cost, which you raised before, and doesn't consider the environmental or social impact' before 'I think there should be consideration as to how that'.

Resolved, on the motion of Ms Suvaal: That the following new paragraph be inserted after paragraph 2.25: 'In contrast, the objects of the Electricity Infrastructure Investment Act explicitly include 'to foster local community support for investment in new generation, storage, network and related infrastructure.' [FOOTNOTE: Answers to questions on notice, EnergyCo, 6 March 2024, p 1].

Resolved, on the motion of Ms Suvaal: That:

a) paragraph 2.26 be amended by inserting at the end: 'although no specific examples were provided' after 'environmental considerations'

b) the following new paragraph be inserted after paragraph 2.26: 'However, Mr Da Silva Alvarez of Iberdrola noted in evidence that "the regulatory framework for the UK… is based on less cost for consumers".' [FOOTNOTE: Evidence, Mr Ricardo da Silva Alvarez, Business Development Manager, Iberdrola Australia, 16 February 2024, p 29].

Resolved, on the motion of Ms Suvaal: That the following new paragraphs be inserted after paragraph 2.28: 'Evidence from electricity consumer advocates, however, noted the importance of minimising the costs of electricity infrastructure. For example, the Energy Users' Association of Australia noted in its submission that the costs of transmission infrastructure on consumer bills "flows through the whole economies value chains to goods and services and ultimately the cost of living for householders'. [FOOTNOTE: Submission 29, Energy Users' Association of Australia, p 1].

Similarly, Mr Adams

Similarly, Mr Adams of Energy Networks Australia noted:

> I think we saw it flow through with the most recent cost-of-living crisis. It started with what was going on in Ukraine and it started with gas shortages, and that pushed up wholesale prices domestically here with our gas markets that are linked internationally. And that flows through to everything—the cost of steel and the cost of all sorts of goods and services. It's not just your energy bill that goes up; everything goes up… Energy is one of the core planks of our whole economy. [FOOTNOTE: Evidence, Mr Dominic Adams, General Manager – Networks, Energy Networks Australia, p 28].

Mr Corbell also explained the importance of how the regulatory test seeks to minimise costs to electricity consumers:

> In general, the way that this regulatory environment operates is that, first of all, it is a recognition that transmission is a natural monopoly and, therefore, the owner of those assets is able to seek costs for the development of that infrastructure from all of the consumers who benefit from it. As a result, the Australian Energy Regulator has to have regard to minimising cost impacts for consumers, because this is a monopoly asset with a regulated asset base, and that transmission owner, the monopoly operator,

> can only seek to recover its costs from consumers where it is the most cost-efficient piece of infrastructure to recover costs from. Basically, transmission infrastructure operators are not allowed to build expensive pieces of kit that are not the cheapest, most suitable solution and then ask consumers to pay for it through their electricity bills'. [FOOTNOTE: Evidence, Mr Corbell, 27 November 2023, p 24].

Resolved, on the motion of Mrs Carter: That the heading above paragraph 2.28 be amended by inserting 'Financial' before 'costs borne by the customer'.

Ms Suvaal moved: That paragraph 2.39 be omitted: 'Further, Mr Piper reported that whilst work had not officially commenced on the project, a neighbour had reported to him that 'EnergyCo… [was] really twisting his arm to give access to a drilling rig to start mechanical work on his property'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Ms Suvaal moved: That paragraph 2.47 be omitted: 'In a similar context, there was concern from some around the number of additional roads which may require upgrades throughout the project. Whilst acknowledging some road upgrades were included within the EIS, Miss Emily Bowman specified that it was 'unacceptable that the EIS can be released and perhaps approved without all of the possible road upgrades listed and thoroughly investigated'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Ms Suvaal moved: That paragraph 2.55 be amended by:

a) inserting 'for some stakeholders' before 'that the RIT-T criteria are too narrow'

b) inserting 'some' after 'acknowledge that'

c) omitting 'crucial' before 'non-economic factors'

d) omitting 'and triggers within electricity transmission projects, requiring the reapplication of necessary RIT-T tests. Where 'material changes' have occurred'

Mrs Carter moved: That the motion of Ms Suvaal be amended by omitting 'for some stakeholders' before 'that the RIT-T criteria are too narrow'.

Amendment of Mrs Carter put and passed.

Original question of Ms Suvaal, as amended, put and passed.

Ms Suvaal moved: That paragraph 2.56 be omitted: 'The committee also believes that the requirement for consumers to pay for transmission infrastructure in the National Energy Rules needs to be revisited, given the scale of transmission upgrades needed as a result of the switch to renewable energy' and the following new paragraph be inserted instead:

> 'The committee notes the regulatory system is designed to minimise the cost impacts of the new network infrastructure on electricity consumers and the importance of this approach, particularly at a time when cost of living pressures are pronounced, and noting the flow-on effects of electricity prices throughout the economy.'

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Ms Faehrmann, Mr Fang, Mrs Carter, Mr Roberts

Question resolved in the negative.

Ms Suvaal moved: That paragraph 2.57 be amended by omitting: 'While we are heartened by these changes and their attempt to include broader factors in the regulatory assessment of projects, it is arguable that the absence of these non-economic factors in the original RIT-T test applied to the HumeLink project helped to allow a project to be approved that failed to adequately consider social and environmental factors'.

Mrs Carter moved: That the motion of Ms Suvaal be amended by:

a) inserting 'as' before 'applied to the HumeLink project'.

b) omitting 'helped to allow a project to be approved that failed to adequately consider social and environmental factors' and inserting instead 'partially facilitated the approval of a project which did not give sufficient weight to social and environmental factors'.

Amendment of Ms Carter put and passed.

Original question of Ms Suvaal, as amended, put and passed.

Ms Suvaal moved: That Finding 1 be omitted: 'There is a lack of transparency pertaining to whether material changes to the HumeLink project, including cost, have resulted in Transgrid re-performing the required RIT-T test, in accordance with changes to the Australian Energy Regulator's guidelines'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Ms Suvaal moved: That:

a) paragraph 2.58 be omitted: 'We also accept that there is still a failure to consider broader environmental elements within the National Electricity Rules and RIT-T process for major electricity transmission and distribution projects. To fill this gap, we recommend that the 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'.

b) Recommendation 1 be omitted: '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'.

Question put.

The committee divided:

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Mrs Carter: That paragraph 2.60 be amended by omitting 'include information which is either incomplete or does not take into' and inserting 'not have had sufficient information to allow for'.

Resolved, on the motion of Ms Suvaal: That:

a) paragraph 2.61 be amended by:

   i. omitting 'Critical State Significant Infrastructure (CSSI) and State Significant Infrastructure (SSI) projects, the State Significant Infrastructure Guidelines' and inserting 'relevant guidelines'

   ii. omitting 'clear' and inserting 'possible'

   iii. omitting 'the State Significant Infrastructure Guidelines' and inserting 'relevant guidelines'.

b) Recommendation 2 be amended by:

   i. omitting 'further amend' and insert 'consider further amending'

   ii. omitting 'State Significant Infrastructure Guidelines' and inserting 'relevant guidelines'.

Ms Suvaal moved: That the following new paragraph be inserted after paragraph 3.1: 'However, notwithstanding the genuine conviction of community and other stakeholders, the strong weight of expert evidence highlighted the negative cost, environmental and timing impacts of undergrounding'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That:

a) the following new paragraph be inserted after paragraph 3.5: 'However, as pointed out by Transgrid, the Amplitude report costed a different (and smaller) scope than the GHD report'

b) paragraphs 3.6 and 3.7 be omitted: 'The Amplitude report did not contain estimated costings for the construction of the HumeLink using HVAC cables. However, the report noted that the estimated CAPEX for the project would be:

   • using option 2A-1 (100% HVDC cables undergrounded) from the GHD report $7.3 billion, and

   • using option 1C (direct point to point HVDC connection between Maragle and Bannaby using HVDC underground cables) from the GHD report, $5.46 billion.

   One of the report's authors, Mr Les Brand, Managing Director, Amplitude Consultants, was questioned by the committee about the costings contained within both the GHD and Amplitude reports. Mr Brand stressed that the undergrounding costings presented within the Amplitude report were a worst-case construction scenario, using a cut-and-lay method, which is a slower construction approach. When questioned about a potential for an overstatement of operating costs within the GHD report, Mr Brand remarked that the figures were 'extraordinarily high'. In defence of option 2A-1, Transgrid stated that the 1928MWI capacity cited by Amplitude consultants was 'significantly less than the 2,570MW provided by GHD's option'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That paragraph 3.8 be amended by omitting 'was disagreement' and inserting instead 'was a range of views'.

Resolved, on the motion of Ms Suvaal: That the following new paragraphs be inserted after paragraph 3.12: 'However, the other evidence suggested that Mr Brand's solution of using HVDC cables would not be feasible in the context of the transmission required in NSW and that it was very expensive. For example, this was pointed out in the Energy Corporation of NSW's submission [FOOTNOTE: Submission 35, Energy Corporation of NSW, p 7.] Associate Professor Roger Dargaville of the Monash Energy Institute also noted:

> I think the issue here is that the expense of converting from AC to DC and back again for relatively short trunks of transmission would be prohibitively expensive. You normally only do DC above ground or below ground for stretches of hundreds of kilometres. The AC-DC converters are very, very expensive. If you were just doing it to do tens of kilometres to maybe divert around a particular community, the economics would not stack up' [FOOTNOTE: Evidence, Associate Professor Roger Dargaville, Interim Director, Monash Energy Institute, 16 February 2024, p 1]

Resolved, on the motion of Ms Suvaal: That paragraph 3.27 be amended by omitting 'highlighted' and inserting instead 'sought to assert'.

Ms Suvaal moved: That paragraph 3.63 be omitted.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That the following new paragraph be inserted after paragraph 3.65: 'Mr James Hay, CEO of the Energy Corporation of NSW' noted EnergyCo's commitment to genuine community engagement and local support for infrastructure, as well as the need for continuous improvement:

> Everything we do, because it's all paid for by electricity consumers, has to be run through that reference. The Electricity Infrastructure Investment Act in its objectives specifically added in the words about fostering local community support, because it recognises that consumer licence—which is those who are paying for the infrastructure—isn't the same as local community support. EnergyCo is very, very focused on that local community support, and that's one of our objectives that we have to meet. The Act was a big step forward from the National Electricity Market in requiring us to focus on those factors. Are we learning as we go? Absolutely. Are we trying to constantly improve? Absolutely'. [FOOTNOTE: Evidence, Mr James Hay, Chief Executive Officer, Energy Corporation of NSW, 16 February 2024, p 35]

Resolved, on the motion of Ms Suvaal: That the following new paragraph be inserted after paragraph 3.72: 'Further, EnergyCo and Transgrid noted improvements in design standards to ensure transmission infrastructure can withstand more extreme weather events. For example Mr Kingsmill advised the committee:

> There is always a balance in terms of cost versus resilience. I know that in Queensland, when they designed their transmission lines, they designed them to cyclonic wind ratings where they are in that part of the State. I think design standards are fairly key there, but I can assure the panel that we have taken that into account in our design standards. [FOOTNOTE: Evidence, Mr Kingsmill, Executive Director, Network Planning and Technical Advisory, Energy Corporation of NSW, p 36.]

Mr Roberts also noted:

> The standards that we apply, the AS 7000 standards, specifically say, for the HumeLink example, they are built to at least a minimum of 165 kilometres per hour wind, up to 200 kilometres per hour wind gusts—as opposed to, I'm led to believe, the wind gusts that occurred in Victoria a couple of days ago were 130 kilometres per hour. The standards we build to now are far higher. [FOOTNOTE: Evidence, Mr Jeremy Roberts, Major Project Delivery Director, Transgrid, 16 February 2024, p 53.]

Resolved, on the motion of Ms Suvaal: That paragraph 3.74 be amended by:

a) omitting 'need for benefits of gaining and building' and inserting instead 'the lack of'

b) omitting 'availability of necessary resources' and inserting instead 'difficulty and cost of obtaining necessary materials'.

c) omitting 'Some witnesses suggested that obtaining expertise was necessary for the State'.

Ms Suvaal moved: That paragraph 3.95 be omitted.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That a new paragraph be inserted after paragraph 3.95: 'As noted in the first inquiry's report, the senior RFS representative who gave evidence at the inquiry was unable to say either that high voltage transmission lines would cause more fires that do occur worse than they would otherwise be' [FOOTNOTE: Evidence, Mr Jayson McKellar, Director Area Operations (Northern), Assistant Commissioner, Rural Fire Service, 27 July 2023, p 19.]

Ms Suvaal moved: That paragraph 3.97 be omitted.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal that a new paragraph be inserted after paragraph 3.107: 'Although EnergyCo's submission noted:

> Continual maintenance of both the underground cable and the easement are required. Due to the sensitivity of the asset, deep-rooted plants are not permitted within easement areas, 28 to avoid damage to the cables. This inhibits biodiversity recovery following construction, and prevents agricultural cropping. By contrast, within overhead line easements trees and shrubs of a height of less than 3 m are permitted' [FOOTNOTE: Submission 35, Energy Corporation of NSW, p 14.]

Ms Suvaal moved: That paragraphs 3.108 and 3.109 be omitted: 'In their evidence, Upper Lachlan Landcare suggested that the HumeLink project will have 'long lasting and irreversible impacts on local biodiversity and connectivity'. Further, they added that the negative impacts were unable to be offset by revegetation efforts and believed that underground cables provide the favored solution to minimise destruction to the area.

Similar views were shared by Goulburn Mulwaree Council, suggesting that undergrounding the infrastructure for the HumeLink project would reduce the impacts to biodiversity associated with the clearing of larger corridors, where the infrastructure is placed above the ground.'

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That paragraph 3.126 be omitted: 'Similar views were expressed by landowners and communities impacted by the HumeLink project. Mr David Bowman argued in his submission that overhead power lines will devalue rural land, noting a reluctance from landholders to host such infrastructure on their properties.'

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That paragraph 3.136 be omitted: 'For example, Mr Piper stressed that farming will be impacted near energy transmission lines associated with the Central-West Orana REZ project. Specifically, Mr Piper noted that 'mainly the livestock activities that will be affected'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Ms Suvaal moved: That paragraphs 3.139-3.144 be omitted: 'Similar views were expressed by landowners and communities impacted by the HumeLink project. Mr David Bowman argued in his submission that overhead power lines will devalue rural land, noting a reluctance from landholders to host such infrastructure on their properties.

In its submission to the committee, CWO REZist made further arguments on the impacts on farming. It was highlighted that:

> this predominately agricultural area of the CWO REZ [Central-West Orana REZ project] would affect our ability to produce food in the short and long term, and negatively affect the income of farmers in impacted areas, at the very least during the construction period.

At the first inquiry, Mr Donald Bull, an impacted community member, told the committee that the proposed HumeLink overhead power lines would affect farming practices, prohibiting the use of both aerial sprayers and water planes.

At a public forum in Tumut during the first inquiry, Mr Jim Morgan relayed a story of an aerial crop duster working over overhead powerlines, in order to explain the impact these lines can have on individual famers and landowners. He explained:

> [O]n my property at Lockhart, they had an aerial crop duster flying. He passed over the powerlines about 10 times and then, one of his runs, he connected with the powerlines. This was in 2021. He brought down 3.5 kilometres of double powerlines, broke off two cement poles—got away with his life, fortunately. He didn't crash the plane. That cost that company $27,000 in repairs, and that company wore the whole cost of that because their excess is greater than that. But that was a cost to an individual with powerlines.

Further, Mr John Gormly, an impacted farmer stated that his cropping contractor will not work near or under high voltage powerlines. In this context, Mr Gormly reported that his agricultural income options will change, due to the loss of an income stream, that 'may make the farm economically marginal'.

A Dunedoo district farmer, Miss Emma Bowman, shared similar sentiment, reporting in her evidence that impacts to farming would be dependent on the season, but would likely impact livestock, resulting in some properties not remaining operational. The submission also noted that 'construction may also result in crops not being sown'.

In the context of the HumeLink project, one impacted farmer reported in evidence that critical weed management cannot be made as a result of a helicopter landing pad becoming untenable. Further, alternatives such as traversing the land by motor vehicle were cited not possible, due to the nature of the farmland terrain.'

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That paragraph 3.160 be amended by omitting 'very' before 'difficult' and by omitting at the end: 'It was also immediately apparent that many of the concerns raised in the first inquiry by the State Development committee remain unresolved and in dispute – chief of these being concerns around cost.'

Resolved, on the motion of Ms Suvaal: That paragraph 3.161 be amended by omitting 'While acknowledging the paucity of applicable evidence, the available information does seem to support the fact that undergrounding electricity transmission infrastructure is more costly, however the question remains as to by how much more.' and inserting instead 'The committee notes Transgrid's evidence that the Amplitude report costs a different scope, with lower capacity, to what is proposed for Humelink. The committee also notes that the available evidence does seem to support the fact that undergrounding electricity transmission infrastructure is more costly, however the question remains as to by how much more.'

Resolved, on the motion of Mrs Carter: That paragraph 3.161 be amended by inserting at the end: 'One of the issues the committee encountered with respect to determining the cost differential was competing evidence about whether the same project, with the same specifications, had been costed'.

Resolved, on the motion of Ms Suvaal: That Recommendation 3 be omitted 'That the NSW Government work with the Commonwealth Government on regulatory reform that will ensure a fairer sharing of the cost of electricity transmission infrastructure, between consumers, energy transmission and generation companies and State and Federal governments' and the following new recommendation be inserted instead:

> 'That the NSW Government consider regulatory reform that will ensure a fairer share of the financial cost of electricity transmission infrastructure, so that it is not solely borne by the consumer.'

Resolved, on the motion of Ms Suvaal: That paragraph 3.162 be amended by:

a) omitting: 'through higher electricity bills. We believe there is a greater role for both State and Federal governments to play in this area and call on the NSW Government to work with the Commonwealth Government on', and

b) inserting instead 'We call on the NSW Government to consider regulatory reform that will ensure a fairer share of the financial cost of electricity transmission infrastructure, so that it is not solely borne by the consumer'.

Resolved, on the motion of Ms Suvaal: That paragraph 3.164 be amended by:

a) omitting: 'there is an over reliance on overhead transmission lines. This is due to past practices and the fact that'

b) inserting 'current' before 'cost and benefit assessment'

c) omitting 'cables' and inserting instead 'transmission lines' and,

d) omitting 'because of this' after 'in many situations'

Ms Suvaal moved: That paragraph 3.164 be amended by:

a) omitting 'must' and inserting instead 'should', and

b) inserting 'including the impact on communities and landholders' after 'also be considered'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Ms Suvaal moved: That:

a) paragraph 3.166 be omitted: 'Moreover, it seems that the appeal of upfront lower costs associated with traditional overhead AC power lines may deter transmission providers and infrastructure planners from investing in crucial newer technologies to support the demand for electricity. We believe there is an urgent need to develop and grow Australia's capacity, expertise and workforce in underground cables, including the domestic manufacture of cables and ensuring that the supply of cables can be guaranteed through the global supply chain. We urge the NSW Government to commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology, the existing capacity of the domestic workforce and industry and the requirements for a domestic manufacturing industry', and

b) Recommendation 5 be omitted: 'That the NSW Government commission an independent assessment into the costs and benefits of undergrounding transmission infrastructure technology, the existing capacity of the domestic workforce and industry and the requirements for a domestic manufacturing industry'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That paragraph 3.167 be amended by omitting 'for example, using undergrounding through certain environmentally sensitive areas or where bushfire risk is greater, and overhead transmission lines for the remainder of the project' and inserting instead 'noting the primary benefit of undergrounding is that it avoids visual impact'.

Mr Fang moved: That the motion of Ms Suvaal be amended by omitting 'noting the primary benefit of undergrounding is that it avoids visual impact' and inserting instead 'for example, where sensitivities occur, such as potential visual or agricultural impacts, or bushfire risk'.

Amendment of Mr Fang put and passed.

Original question of Ms Suvaal, as amended, put and passed.

Resolved, on the motion of Ms Suvaal: That paragraph 3.168 be amended by:

a) omitting 'The evidence received regarding the feasibility of a hybrid approach for the transmission projects examined by this and the first inquiry was limited, due, in part, to a lack of research on the topic, something acknowledged by witnesses from Monash University. However,'

b) omitting 'due to environmental or cultural sensitivities, or strong community opposition'

Mr Fang moved: That Recommendation 6 be amended by inserting 'social, agricultural' after 'undergrounded cables to reduce'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Ms Suvaal moved: That Recommendation 6 be amended by omitting 'examine the feasibility of a 'hybrid' approach to current and future transmission infrastructure projects, and explore ways to better support the use of undergrounded cables to reduce cultural or environmental impacts wherever practicable' and inserting instead 'consider opportunities for a 'hybrid' approach for transmission infrastructure projects, and explore ways to better support the use of undergrounded transmission to address sensitivities, wherever practicable'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Mr Fang, Mr Roberts.

Question resolved in the affirmative.

Resolved, on the motion of Ms Suvaal: That paragraph 3.170 be amended by 'omitting considerations of social cost' and inserting instead 'requirements for community consultation'.

Resolved, on the motion of Ms Suvaal: That:

a) paragraph 3.171 be amended by omitting 'Becoming a member' before 'appears to us', and omitting 'and therefore we encourage it to become a member' after 'more genuinely with the community' and

b) Recommendation 7 be amended by omitting 'including joining as a member' after 'its relationship with the Energy Charter'.

Ms Suvaal moved: That paragraph 3.128 be amended by inserting 'in addition to compensation for easements under the *Just Terms Act*' after 'kilometre'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That:

a) Finding 3 be amended by:

i) omitting 'electricity transmission providers and the NSW Government have not adequately explained to the community the options, opportunities' and inserting instead 'more information is needed to adequately explain to the community the options', and

ii) omitting 'the Government's net zero vision' and inserting instead 'the NSW Government's legislated Net Zero and renewable energy targets'.

b) Recommendation 8 be amended by:

i) omitting 'establish a body that has overall responsibility for ensuring' and inserting instead 'develop and implement a plan to ensure'.

Mr Fang moved: That:

a) the following new finding be inserted after paragraph 3.172:

'**Finding X**

Transgrid has failed to accurately model and cost the HumeLink project for anything other than the current overhead proposal, which has resulted in alternate solutions such as the undergrounding of transmission lines not being properly considered'

b) that the following new recommendation be inserted after paragraph 3.172:

'Recommendation X
Transgrid should urgently reassess the HumeLink project, to consider all construction methods, technologies and impacts, with consideration of a wider definition of the project's costs to include social, community and future factors in any determination'.

Question put.

The committee divided.

Ayes: Mrs Carter, Mr Fang, Mr Roberts.

Noes: Mr Buttigieg, Ms Faehrmann, Mr Lawrence, Ms Suvaal.

Question resolved in the negative.

Ms Suvaal moved: That paragraph 3.110 be amended by inserting 'Although, it was not clear what method of undergrounding the National Parks Association of NSW relied on when preferencing this approach'.

Question put.

The committee divided.

Ayes: Mr Buttigieg, Mr Lawrence, Ms Suvaal.

Noes: Mrs Carter, Ms Faehrmann, Mr Fang, Mr Roberts.

Question resolved in the negative.

Resolved, on the motion of Ms Suvaal: That the following new recommendation be inserted after recommendation 8.

'Recommendation X
That the NSW Government ensure appropriate information about the need for transmission infrastructure and the costs and benefits of undergrounding compared to overheading is made available to the public to support informed discourse on the topic'.

Resolved, on the motion of Mrs Carter: That:

- The draft report as amended be the report of the committee and that the committee present the report to the House;
- The transcripts of evidence, submissions, tabled documents, answers to questions on notice and correspondence relating to the inquiry be tabled in the House with the report;
- Upon tabling, all unpublished attachments to submissions be kept confidential by the committee;

- Upon tabling, all unpublished transcripts of evidence, submissions, tabled documents, answers to questions on notice and correspondence relating to the inquiry, be published by the committee, except for those documents kept confidential by resolution of the committee;
- The committee secretariat correct any typographical, grammatical and formatting errors prior to tabling;
- The committee secretariat be authorised to update any committee comments where necessary to reflect changes to recommendations or new recommendations resolved by the committee;
- Dissenting statements be provided to the secretariat within 24 hours after receipt of the draft minutes of the meeting;
- The secretariat is tabling the report at 10.30 am on Thursday 28 March 2024;
- The Chair to advise the secretariat and members if they intend to hold a press conference, and if so, the date and time.

7. Other business

Resolved, on the motion of Ms Suvaal: That the committee authorise the publication of supplementary submission nos. 12a and 51a.

8. Adjournment

The committee adjourned at 2.11 pm, *sine die*.

Daniel Whiteman
Committee Clerk

Appendix 4 Dissenting statements

Hon Wes Fang MLC, The Nationals

While I commend the majority of this report, along with the majority of its findings and recommendations, I must note two discrete issues which I believe result in this report falling short of what it could have been.

In Recommendation 6, I sought an amendment to specifically include social impacts and agricultural impacts as valid justifications for the consideration of undergrounding transmission infrastructure. This was narrowly defeated. It is noted however, paragraph 3.167 was amended to include visual or agricultural impacts when identifying examples for the consideration of the use of underground transmission infrastructure. With respect to this matter, regardless of whether Recommendation 6 explicitly states it or not, the report identifies examples such as agriculture for consideration of undergrounding transmission infrastructure.

The other issue, was the failure to adopt a further Recommendation, stating;

> *Transgrid should urgently reassess the HumeLink project, to consider all construction methods, technologies and impacts, with consideration of a wider definition of the project's costs to include social, community and future factors in any determination.*

I believe the evidence obtained during both inquiries into the issue of undergrounding transmission infrastructure, supports a reassessment of Humelink. It is clear, the widespread community concern related to this project, isn't reflected in this report.

Finally, I note this second report on the issue of the feasibility of undergrounding transmission infrastructure since the start of the 58th Parliament, demonstrates why the second inquiry was necessary. The contrast between this report and the other Government-dominated propaganda piece should serve as a reminder to all, the integrity of the committee process is paramount.

Hon Emily Suvaal MLC, Hon Mark Buttigieg MLC, Hon Stephen Lawrence MLC, Australian Labor Party

We appreciate that a majority of the Committee has sought to showcase the diversity of opinion in relation to the issue of undergrounding transmission infrastructure for renewable energy projects in NSW. We also accept that some communities have significant concerns about the impact of transmission and associated infrastructure.

However, we do not agree with Recommendation 5 of the report that a further assessment of the costs and benefits of undergrounding transmission infrastructure be undertaken. The feasibility of undergrounding transmission infrastructure has now been the subject of two parliamentary inquiries in less than a year. There is clearly a divide between community views and most transmission experts, but we do not agree that this divide can be resolved with further studies. The NSW Government has made clear its position to deliver the infrastructure needed to transform NSW's energy system as quickly as possible. Communities require clear information and to see the benefits of this transformation, not further studies.

We otherwise do not take issue with the recommendations in the report and were glad to contribute additions and amendments to strengthen the report, which have been adopted by the Committee.