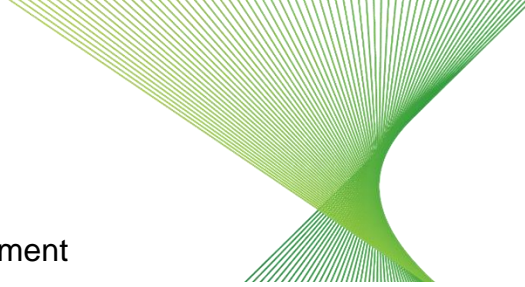


Question on Notice

Legislative Council Standing Committee on State Development



Question 1

What the percentage increase to the consumer bill would be if HumeLink was undergrounded or some statistic around that increase?

The CPA-2 for HumeLink will look at the indicative impact on consumer bills over the 2023-28 period from our investment in HumeLink, this will be lodged with the Australian Energy Regulator (AER) in October.

Under the regulatory framework the AER's role as the economic regulator is to determine if capital costs proposed by the Network Operator are prudent, efficient and reasonable to ensure lowest long-term cost to consumers for the most appropriate investment.

The savings to consumers in both metropolitan and regional Australia is enabled through access to cheaper renewable energy.

A June 2022 report by Endgame Economics found prompt investment in transmission upgrades reduces the average wholesale price of electricity, however extended delays to transmission upgrades results in higher and more volatile prices..

It also found that the increase in average wholesale cost added to consumer bills with a delay, greatly outweighs the small reduction in transmission cost due to deferred transmission capital expenditure.

For example, in New South Wales the predicted residential consumer bill increase due to transmission delays is \$283 (1.4 per cent) for a one-year delay to the ISP base case, \$575 (2.8 per cent) for a two-year delay, and up to \$1,428 for a four-year delay (6.9 per cent) (calculated over the FY26-2040 period, in real \$2022).

NEXA Economics in a report released this month, highlighted the impacts on consumer bills on the non-timely delivery of the energy transition and failure to meet the goals outlined in the 2022 ISP, stating the typical consumer will pay between \$4,500 and \$6,000 more cumulatively (dependent on state) over the next twenty years.

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Question 2

Emma Hurst:

There was a submission that the Committee received that said their experience with a fire was that Transgrid did not turn the power off. I don't know if you have seen that submission, but I'm wondering if you know that incident.

Brett Redman: No. I apologise I have not seen that submission, so I can come back and respond directly to the facts on that.

The NSW Rural Fire Service (RFS) is the lead agency responsible for emergency response in bushfires as outlined in the Rural Fires Act 1997. In this role, NSW RFS is the Incident Controller and its Incident Management Team determines priorities for the protection of people, properties and land, as it manages the bushfire response. Transgrid is part of the response, along with other agencies, and provides information and specialist response services to NSW RFS' incident management team as they lead firefighting operations. In such circumstances, Transgrid complies with the directions of the RFS to ensure the safety of the firefighters, the impacted communities and Transgrid's personnel..

The fire referred to in the submission, is known as the Dunns Road Fire. Transgrid had a liaison officer located in the RFS Incident Management Team during this event, for the purpose of providing advice relating to impacts and/or associated risks of various strategies and fire impact to infrastructure and service delivery, including acting as a conduit between the RFS Incident Controller and the Transgrid Control Centre where appropriate.

Records indicate that in relation to the Dunns Road Fire, which burned within the Snowy Valley LGA from 28 Dec 2019 to 15 Feb 2020, that the Transgrid Control Centre received five requests to de-energise overhead transmission lines, that were actioned as requested.

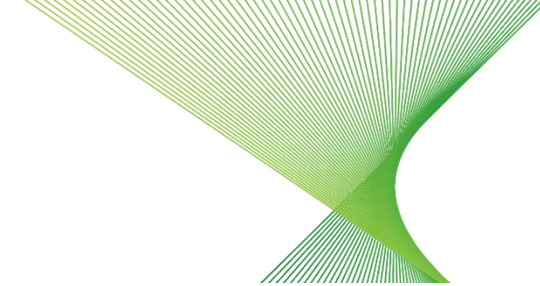
- 3 Jan 2020 - 330kV Transmission Line No 65 - Upper Tumut to Murray
- 3 Jan 2020 - 330kV Transmission Line No 64 - Upper Tumut to Lower Tumut
- 3 Jan 2020 - 330kV Transmission Line No 2 - Upper Tumut to Yass
- 3 Jan 2020 - 330kV Power Station Transmission No U3 - Upper Tumut to Tumut
- 3 Jan 2020 - 330kV PowerStation Transmission No U5 - Upper Tumut to Tumut

During the 2019-2020 bush fires, RFS State Operations and the Energy and Utility Services Area (EUSFA) developed an Operational Guideline for Electricity Safety that standardised the process to ensure all requests were documented.

District Duty officers and our Call Centre Supervisors maintain emergency contact details at the local and State level for all Network Service Providers (NSPs).

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Question 3

Can you please provide the project costings and assumptions for the HumeLink Project, both for the proposed overhead transmission line and studies done for underground solutions?

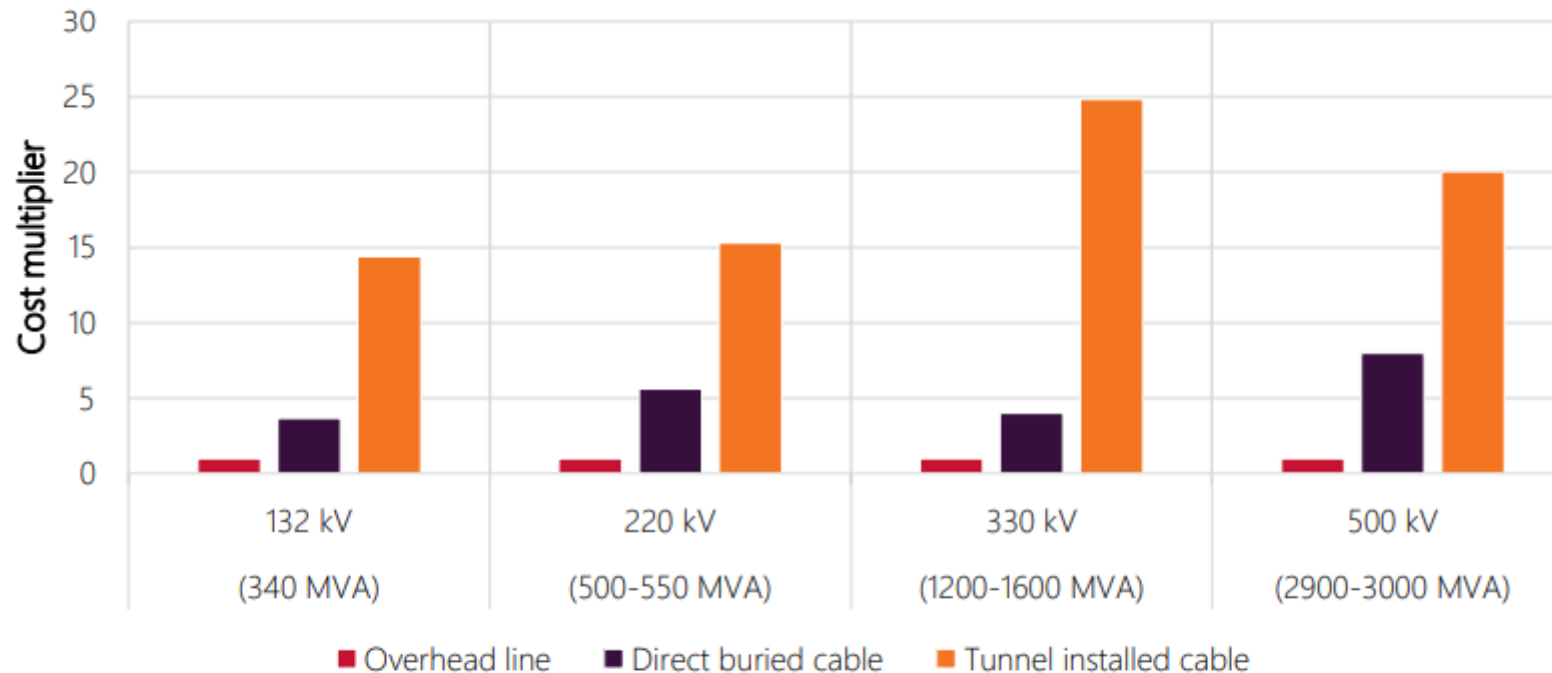
The latest official cost estimate for the HumeLink project, which is overhead AC, is AU\$5billion. It would be expected the costs of the other options, including undergrounding, would also be impacted by inflation, increases in the cost of labour, materials and interest rates. and/or the broader price level.

Underground HVDC studies were completed and were found to be two to three-times the cost if it was a typical generation source to demand source. Since this is a collector line for renewable energy, it would require additional AC to DC converter stations which were not considered in the undergrounding studies completed. These are typically AU\$400 to AU\$500 million per station for 500kv lines. With multiple converter stations the line costs would quickly exceed the previously estimated costs.

Underground HVAC it not an option for lines that exceed 40km – 50km asAC lines at high voltage level are subject to very large charging currents, requiring significant reactive compensation and design considerations. This will further increase the costs of an UG HVAC line. Based on the limitations of underground HVAC, the undergrounding studies provided did not consider an HVAC solution.

The table below is from the 2021 Transmission Cost Report published by AEMO <https://aemo.com.au/-/media/files/major-publications/isp/2021/transmission-cost-report.pdf?la=en>

Figure 5 Indicative unit cost multiplier from HVAC overhead lines to HVAC underground cables

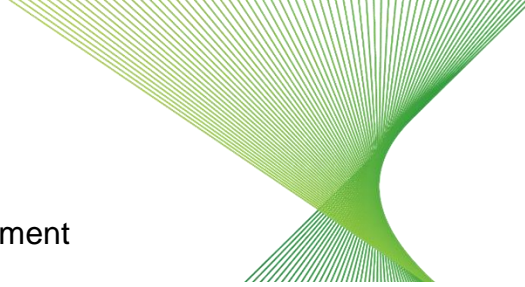


Notes:

- This chart shows cost factor increases relative to the respective overhead option on a generic unit cost basis. Underground 500 kV HVAC options cost more than 330 kV HVAC options, but the cost factor increase is higher when undergrounding a 330 kV HVAC option compared to undergrounding a 500 kV HVAC option.
- This chart has been prepared using AEMO's Transmission Cost Database and may not provide an appropriate comparison for all projects due to local circumstances.
- This cost comparison is indicative of the variable per unit cost of overhead lines and underground cables. The total project cost is sensitive to factors such as terrain, geotechnical constraints, and fixed cost factors associated with transition stations.

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Question 4.

Can you please provide a copy of the business case for the HumeLink project? Does the business case for HumeLink require the future connection of additional renewable energy projects along its corridor?

The consumer benefits of HumeLink were fully outlined using a three-part market benefits test. This Regulatory Investment Test – Transmission (RIT-T) is the public economic cost benefit test administered by the Australian Energy Regulator (AER) on all projects with a value of more than \$6 million.

The documents include:

- Project Specification Conclusions Report (PSCR) - detailing the need to reinforce the transmission network in southern NSW to increase capacity to the state's demand centres and describes credible options to meet the need, including technical characteristics that would be required of a non-network option.
- Project Assessment Draft Report (PADR) - a full quantitative analysis of the proposed options and expected market benefit across a range of scenarios and sensitivities, published as supporting documents.
- Project Assessment Conclusions Report (PACR) - addresses PADR consultation responses and determines the final preferred option.
- Project Assessment Conclusions Report (PACR) Addendum - this addendum has been prepared in response to the AER's dispute determination and extends the analysis presented in the HumeLink PACR published in July 2021.

The HumeLink Project Assessment Conclusions Report investigated seven scenarios that covered a broad range of potential outcomes across the key uncertainties that are expected to affect future market benefits of the investment options considered and reflect the scenarios used by AEMO in its final 2020 ISP.

This PACR selected the option that involved a new 500 kV double-circuit line in an electrical 'loop' between Maragle, Wagga Wagga and Bannaby, which is expected to deliver approximately \$491 million in net benefits over the assessment period (on a weighted-basis) and is the preferred option identified under the RIT-T. The option was found to have approximately 23 per cent greater estimated net benefits than the second ranked option.

It must also be noted that activities not related to the RIT-T but necessary to progress assessment of the project to achieve approval, were also undertaken, including the Environmental Impact Statement process which included community and stakeholder consultation online route specifics for the preferred option as well as social, environmental, cultural heritage, flora and fauna, and economic considerations.

Extensive stakeholder consultation was undertaken to investigate the potential credible options for reinforcing the Southern Shared Network of New South Wales to enable the southern NSW generation to best serve load centres in New South Wales and ensure the robustness of the RIT-T findings.

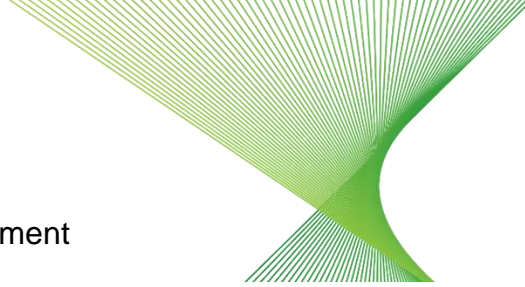
This consultation included publication of a separate detailed market modelling and assumptions report, a consultation session at the public forum on the PADR on 12 February 2020, briefing the Customer Panel, bilateral discussions with interested stakeholders, and the release of detailed analysis in response to stakeholder requests. The analysis presented in the PACR was informed by this consultation, which has helped test the conclusions reached and ensure the robustness of the analysis.

There are currently substantial new renewable generation developments anticipated in southern NSW, with projects in construction or under development currently totalling 1,900 MW. In addition, Snowy 2.0 will provide a new source of generation to meet future demand in the major load centres of NSW and to 'firm' supply from the new renewable generation.

The HumeLink Project Assessment Conclusions Report can be [read here](#) and the other regulatory documents outlined above can also be found on Transgrid's [website](#).

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Question 5

Can you please detail the work done by TransGrid, both during and after the consultation phase(s), to consider and assess alternate solutions or routes as guided by the feedback from these consultation phases?

Transgrid seeks to determine a route that minimises net impact. Transgrid applies guiding principles to the route selection process including keeping the transmission line as straight as possible, selecting the shortest possible route between two substations and where possible paralleling existing transmission easements or using public land.

In conjunction with these principles, Transgrid uses a constraints mapping process which considers factors including:

- social considerations
- environmental considerations
- land use considerations
- network resilience
- cost

In March 2022, Transgrid completed route refinement decisions on the above-ground study corridor for the HumeLink project in the four key areas of Tumut, Bannaby, Pejar Dam and Green Hills. Over a 12-month period the team consulted with stakeholders, landowners and the community. The four route-refinement decisions were made following this community feedback and all relevant further investigation. The routes are:

1. Tumut area: Tumut North is the preferred route having the lowest impact, best network resilience and lowest cost.
2. Bannaby area: the northern route alternative is the preferred route having the lowest environmental impact and providing the best network resilience.
3. Pejar Dam area: the alternative route paralleling line 3H is preferred, providing greater opportunities for paralleling and a lower amenity impact on Pejar Dam recreational users.
4. Green Hills area: the alternative route through Green Hills State Forest is preferred to minimise impacts to private landowners.

Another alternate route through Green Hills Forest in a north south alignment west of Batlow is also being examined as an option to further reduce impacts on private landowners.