

AER

Determination

HumeLink Early Works Stage 1 (Part 2)
Contingent Project

August 2023

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Executive Summary

HumeLink is an estimated \$3.9 billion (\$2022-23) transmission update linking Greater Sydney load area with the Snowy Mountains Hydroelectric Scheme and Project Energy Connect. It involves 360 km of new 500 kilovolts (kV) transmission lines, which will expand transmission in southern NSW.

HumeLink is included in the Australian Energy Market Operator's (AEMO) 2022 Integrated System Plan (ISP) as a 'staged actionable project' under the optimal development path (ODP).¹

The ISP considers four scenarios of future plausible market developments to capture uncertainty regarding the pace of energy transformation on the path to reach net zero by 2050.² HumeLink delivers value in all scenarios and the project would optimise benefits to consumers if delivery is targeted for 2026-27.³

The value of staging HumeLink is in mitigating the risk that not enough dispatchable capacity is available if there are early coal closures in the period 2025 to 2028. There are two stages in the delivery of HumeLink:

- Stage 1 (Early Works) are pre-construction activities that can be taken while keeping the option to either continue or discontinue the project as new information becomes available.
- Stage 2 is implementation, the completion of the new 500kV transmission that links the Greater Sydney load centre with the Snowy Mountains Hydroelectric Scheme and Project EnergyConnect in south west New South Wales.⁴

Transgrid proposes that the commissioning of HumeLink will be complete by 2026-27, which aligns with AEMO's target project delivery date in the 2022 ISP. Prior to constructing the project, Transgrid is undertaking early works to:⁵

- Determine the prudent and efficient project construction cost by refining the project scope through innovation and cost-effective design.
- Identify, explore and manage the project risks in order to mitigate and/or diversify the project's risks to reduce residual risk costs.
- Progress activities on the critical path and undertake engagements to retain social licence to achieve AEMO's target delivery date of 2026-27.

On 17 August 2022, we approved Transgrid's early works stage 1 contingent project application (CPA) and capex proposal of \$383.3 million (\$2022-23) in full. These works are expected to be completed by July 2024.

¹ AEMO, *2022 Integrated System Plan*, June 2022, p. 61.

² AEMO, *2022 Integrated System Plan*, June 2022, p. 25.

³ AEMO, *2022 Integrated System Plan*, June 2022, p. 68.

⁴ AEMO, *Integrated System Plan Feedback Loop Notice – HumeLink (Early Works)*, 27 January 2022.

⁵ Transgrid, *HumeLink – Stage 1 (Early Works) Contingent Project Application*, 5 April 2022, p.1

Transgrid subsequently identified the need for a second Early Works CPA. Transgrid has referred to the first CPA as stage 1 (part 1) and the additional Early Works CPA as stage 1 (part 2).

Transgrid's early works stage 1 (part 2) included \$226.7 million (\$2022-23) for the procurement of long lead equipment (LLE).

For actionable ISP projects such as HumeLink, our role is to assess whether the trigger event for actionable ISP projects has been satisfied. If we assess the trigger event for actionable ISP projects has been satisfied, our role is then to determine the incremental revenues that will be added to Transgrid's revenue allowance, reflecting the forecast prudent and efficient capital expenditure and operating expenditure required to deliver the project.⁶

Table 1 sets out the incremental revenues that will be added to Transgrid's revenue allowance, the forecast prudent and efficient capital expenditure required to deliver the project, and the estimated impact on the transmission component of residential customer electricity bills in New South Wales.

Table 1 HumeLink contingent project – Assessment of forecast expenditure, revenues and bill impact

	Determination
Proposed total capex (\$ 2022-23) to be commissioned for HumeLink stage 1 (part 2) 2023-24 and 2024-25	\$226.7 million
AER final decision HumeLink stage 1 (part 2)	\$227.9 million ⁷
Stage 1 (part 2) indicative increase in residential electricity bills in NSW over 2024-25 to 2027-28	\$1.1 p.a
Total incremental revenue to be recovered from customers over 2024-25 to 2027-28 (\$ nominal)	\$38.7 million
Stage 1 (part 1) indicative increase in residential electricity bills in NSW over 2024-25 to 2027-28	\$2.60 p.a
Total indicative HumeLink early works increase in residential electricity bills in NSW over 2024-25 to 2027-28	\$3.70 p.a

Source: AER analysis.

The total indicative increase in residential electricity bills in NSW over 2024–25 to 2027–28 from HumeLink early works (part 1 and part 2) is \$3.70 p.a. We acknowledge the bill impact from HumeLink both early works CPAs reflects a minor proportion of total HumeLink costs and expect a further increase in bills following the HumeLink stage 2 CPA.

HumeLink early works stage 1 (part 2)

The purpose of Transgrid's 'early works' stage 1 (part 2) CPA is to secure LLE procurement as part of HumeLink's overall early works activities. LLE refers to items that have a long time between the order and delivery dates. The length of time is typically relative to the length of the project. For HumeLink LLE would be any asset that would take longer than 6 months to deliver.

Stage 1 (part 2) includes the purchase of transformers, reactors, conductors and steel towers. Transgrid has identified this CPA will bring the associated cost forward and reduce its stage 2 CPA forecast capex by an equivalent amount.

⁶ NER, cl 6A.8.2

⁷ This reflects minor modelling adjustments.

The long lead equipment procurement for HumeLink is also part of Transgrid's Powering Tomorrow Together (PTT) procurement strategy. The PTT procurement strategy is a joint procurement process bundling HumeLink, VNI West and EnergyConnect. Transgrid expects this process will result in material cost savings for Transgrid's customers.

The key objective of Transgrid's submission of its stage 1 (part 2) contingent project application in advance of stage 2 is to reduce cost uncertainty, by mitigating against current inflation and to secure supply chain availability by bringing the associated costs forward and reducing the stage 2 cost by an equivalent amount.

The additional early works contingent project, consistent with stage 1 (part 1), provides Transgrid with revenue certainty to undertake activities prior to commencing construction on the project. This revenue certainty is provided in advance of making final investment decisions and is intended to fund activities that reduce future system costs and promote the long-term interests of consumers.

If the project goes ahead, a second round of revenue is provided for the construction phase (stage 2) of the project via the next HumeLink CPA process.

Transgrid can proceed to the next stage of the HumeLink project

Contingent projects are significant network augmentation projects that may arise during a regulatory control period but the need and or timing is uncertain. While the expenditures for such projects do not form part of the total forecast expenditure in a revenue determination, the project costs may ultimately be recovered from customers if the four conditions set out at clause 5.16A.5 are met (also called the 'trigger event') and the project costs exceed a materiality threshold.

The four conditions set out at clause 5.16A.5 of the National Electricity Rules (NER) that will allow Transgrid to recover the prudent and efficient costs of HumeLink (including stages of HumeLink) from customers are:

- Transgrid must issue a Regulatory Investment Test for Transmission (RIT-T) project assessment conclusions report (PACR) that meets the requirements of clause 5.16A.4 and which identifies a project as the preferred option (which may be a stage of an actionable ISP project if the actionable ISP project is a staged project)
- Transgrid as the proponent must obtain written confirmation from AEMO that the preferred option addresses the relevant identified need specified in the most recent ISP and aligns with the ODP referred to in the most recent ISP (this process is the 'ISP feedback loop').
- No dispute notice has been given to the Australian Energy Regulator (AER) under rule 5.16B(c) or, if a dispute notice has been given, then in accordance with rule 5.16B(d), the dispute has been rejected or the project assessment conclusions report has been amended and identifies that project as the preferred option.⁸
- The cost of the preferred option set out in the contingent project application must be no greater than the cost considered in AEMO's ISP feedback loop assessment.

⁸ NER, cl. 5.16B(e)

We are satisfied that all four conditions have been met and as such Transgrid is now entitled to recover revenues from energy consumers to deliver the Stage 1 (part 2) component of HumeLink.

The forecast costs of undertaking stage 1 (part 2) are efficient and prudent

The forecast costs that are reasonably required to deliver the project is the key driver of the incremental revenues that would be recovered from consumers.

Transgrid's application proposed \$226.7 million (\$2022-23) in forecast capex to undertake procurement for early works.

We have examined Transgrid's proposed capex forecast and our view is that the amount proposed is reasonable, prudent and efficient to deliver early works for HumeLink.

In particular, we consider that:

- Transgrid's proposed scope of works reflects activities that can be included in an early works CPA. Our assessment found that Transgrid's proposed scope and equipment ratings for LLE procurement for HumeLink are reasonable as a whole and adopt a prudent approach to meeting the objectives of early works for HumeLink.
- Transgrid's proposed costs for transformers and reactors, steel towers and conductors included in the long lead equipment procurement is efficient as we consider Transgrid's procurement practices are prudent and efficient.
- The benefits to customers in reducing cost uncertainty and mitigating the risk of construction delay offset the increased costs as a result of bringing forward costs that would have been included in Transgrid's HumeLink stage 2 CPA.

Next steps

The incremental revenues we have approved in this determination will now be added to Transgrid's total maximum allowed revenues for the 2023–28 regulatory control period. This follows the process set out in clause 6A.8.2 of the NER.

The increase in allowed revenues will be reflected in customer bills over the remaining four years of the 2023–28 regulatory control period (2024–25 to 2027–28).

The next stage of the HumeLink project will be important in ensuring that Transgrid determines the accurate cost of constructing the full project and obtains all necessary approvals to deliver the project on time. This will ensure that AEMO has all the necessary information when undertaking the ISP feedback loop, and the next CPA includes an accurate updated forecast for the costs reasonably required to construct the project.

We expect that Transgrid will have resolved all outstanding issues relating to the implementation of the project by the completion of both early works processes, including land costs, environmental impacts and biodiversity offsets, project design and LLE equipment.

We also expect that Transgrid also demonstrate the benefits of its early works activities as part of its HumeLink stage 2 contingent project application.

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1 HumeLink contingent project

HumeLink is a \$3.9 billion (\$2022-23) transmission update linking Greater Sydney load area with the Snowy Mountains Hydroelectric Scheme and Project Energy Connect. It involves 360 km of new 500 kilovolts (kV) transmission lines, which will expand transmission in southern NSW.

HumeLink is included in the AEMO 2022 ISP ODP as a ‘staged actionable project’. The ISP considers four scenarios of future plausible market developments to capture uncertainty regarding the pace of energy transformation on the path to reach net zero by 2050.⁹ Under the ISP, AEMO considers that the optimal timing for HumeLink is a target delivery date of 2026-27, with early works delivered by 2024.

HumeLink delivers value in all scenarios and the project would optimise benefits to consumers with a 2026-27 delivery date.¹⁰

The value of staging is mitigating the risk that not enough dispatchable capacity is available if there are early coal closures in the period 2026 to 2028. There are two stages in the delivery of HumeLink. Stage 1 are pro-construction activities that can be taken while keeping the option to either continue or discontinue the project as new information becomes available. We refer to this as an early works contingent project. Stage 2 is implementation, the completion of the new 500kV transmission line that links the Greater Sydney load centre with the Snowy Mountains Hydroelectric Scheme and Project EnergyConnect in south west New South Wales.¹¹

Completion of HumeLink Stage 1 is targeted by June 2025 and Stage 2 by July 2026.¹²

TransGrid applied for an additional Stage 1 contingent project, referred to as Stage 1 (part 2). As a staged project in the ISP, HumeLink will go through the ISP feedback loop assessment for contingent project application. The feedback loop assessment comprehensively tests alignment with the ODP. This may include re-running the ISP modelling if necessary and by considering multiple complex interactions that are unable to be captured within the decision rules.¹³

The HumeLink CPA is the preferred option identified in TransGrid’s RIT-T process. In November 2021, TransGrid amended the HumeLink PACR to include a double circuit option for the path between Maragle and Bannaby as a credible option, to meet the requirement of the NER. The amended PACR concluded that the preferred option in the PACR remained the preferred option. In January 2022, AEMO confirmed that the proposed option and preferred cost is consistent with the ODP in the draft 2022 ISP.

On 17 August 2022, we approved Transgrid’s stage 1 part 1 CPA of \$383.3 million (\$2022-23) in full. This application included Early Works activities, including project design,

⁹ AEMO, *2022 Integrated System Plan*, June 2022, p. 25.

¹⁰ AEMO, *2022 Integrated System Plan*, June 2022, p. 68.

¹¹ AEMO, *Integrated System Plan Feedback Loop Notice – HumeLink (Early Works)*, 27 January 2022.

¹² Transgrid, *A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application*, 23 May 2023, p.16

¹³ AEMO, *2022 Integrated System Plan*, June 2022, p. 69.

stakeholder engagement, land-use planning and approvals and acquisition, procurement activities, and project management.

TransGrid's early works stage 1 part 2 CPA of \$226.7 million (\$2022-23) in forecast capex is for the procurement of long lead equipment (LLE). These early works include the purchase of transformers, reactors, conductors and steel towers. Transgrid has identified its stage 1 (Part 2) application will bring the associated cost forward to stage 1 and reduce its stage 2 forecast capex by an equivalent amount.

1.1 Early works contingent projects

Early works contingent projects were introduced as part of the staging of large transmission projects. Our regulation of actionable ISP projects guidance note identified staging as a means to reduce the risks of actionable projects and increase flexibility to respond to changing market conditions.¹⁴ Early works allows for investing time in the planning and design phase. It can help identify and quantify project risks, and enable innovative and cost effective design.¹⁵

The first early works contingent project was TransGrid's HumeLink stage 1 part 1 CPA which the AER approved on 17 August 2022. TransGrid did not foresee any additional CPA before its HumeLink stage 2 CPA. However, it has included stage 1 part 2 to reflect additional costs to be included in Stage 1 Early Works.

Early works is a relatively recent addition to the regulatory framework. We consider early works contingent projects is an evolving area. Where different cost types are proposed, we would be open to considering those to the extent that the early work would promote the long term interests of consumers.

As demonstrated by our assessment of TransGrid's stage 1 part 2 CPA, we remain committed to being flexible within the regulatory framework and to assist the timely delivery of ISP projects.

We consider early works should produce reliable cost estimates and expenditure forecasts for later CPA stages.

We expect TransGrid to provide information on how early works has assisted in the delivery of a multi-stage contingent project such as TransGrid as part of its stage 2 CPA.

¹⁴ AER, *AER – Final - Guidance Note – Regulation of actionable ISP projects*, March 2021, p.25.

¹⁵ AER, *AER – Final - Guidance Note – Regulation of actionable ISP projects*, March 2021, p.26.

2 Our contingent project determination

Under clause 6A.8.2 of the NER, Transgrid may apply to amend its existing revenue determination to increase allowed revenues for a contingent project. However, we are only required to determine the incremental revenues required to deliver the contingent project if we are satisfied that the trigger event in 5.16.A.5 has occurred, and the project exceeds a cost threshold.

As set out in section 3, the HumeLink CPA meets the conditions required for us to make a determination because:

- we are satisfied that each element of the trigger event for this project has occurred
- we are satisfied that the capex amount of \$226.7 million sought exceeds the applicable materiality threshold of \$44.9 million (5% of MAR).

We have now made a determination on Transgrid's CPA in accordance with clause 6A.8.2 of the NER, which specifies the process we must undertake and the determination we must make on a CPA.

In accordance with clause 6A.8.2(e) of the NER, we have determined:

- the total capex that is reasonably required for the project and the amount of capex for each remaining year of the regulatory control period (see section 4).
- the incremental revenue which is likely to be required by Transgrid for each remaining regulatory year as a result of the efficient capex for the contingent project. This also includes our assessment of a negative capex adjustment for 2022-23 (see section 5), and
- that the project has commenced and is aimed to be completed by July 2026.

We are also required to publish Transgrid's application and invite interested parties to make written submissions.¹⁶ We sought submissions on Transgrid's application on 5 June 2023.¹⁷

In making our determination, we were required under clause 6A.8.2(f) to consider whether we can accept Transgrid's proposed revenues and project expenditure included in its application. This includes considering if its proposed project costs are prudent and efficient. If we are not satisfied that we can accept Transgrid's forecast revenues and project costs, we can determine a different forecast.

Based on our review of Transgrid's application we accept Transgrid's forecast \$227.9 million for capex related to stage 1 part 2 to be incurred in 2023-24 and 2024-25. However, we do not accept Transgrid's proposed negative \$1.1 million capex adjustment to account for the differences between actual and estimated capex in 2022-23. This capex does not relate to stage 1 part 2. Accounting for such differences will be a part of our true-up process in the roll forward model (RFM) and the requirements of the NER.¹⁸

¹⁶ NER, cl. 6A.8.2(c).

¹⁷ No public submissions received during the submission period 5 June 2023 to 30 June 2023 published on the AER [website](#).

¹⁸ NER, cl. S6A.2.1(f)(3).

Our reasoning is set out in section 4.1 and section 5.

We have published on our website a supporting post-tax revenue model (PTRM) for the 2023–28 period which sets out the updated annual revenues and X-factors for the 2023-28 period after including the contingent project amount.

3 Project trigger and expenditure threshold

Under clause 6A.8.2 of the NER, we are required to determine the incremental revenues necessary to deliver the contingent project if we are satisfied that a specific trigger event has occurred, and the project exceeds a cost threshold.

3.1 Assessment of trigger event

The trigger event for the HumeLink project is set out in clause 5.16A.5 of the NER as these triggers relate to actionable ISP projects (including staged actionable projects).

Table 2 sets out the required elements of the post RIT-T actionable ISP project trigger event, as per NER 5.16A.5 and our assessment against each trigger event. We are satisfied that each element of the trigger event has occurred.

Table 2 Post-RIT-T actionable ISP project trigger event (NER 5.16A.5)

Element	Description of trigger event	Assessment
1	The RIT-T proponent must issue a RIT-T project assessment conclusions report that meets the requirements of clause 5.16A.4 and which identifies a project as the preferred option (which may be a stage of an actionable ISP project if the actionable ISP project is a staged project).	Transgrid published a RIT-T project assessment conclusions report (PACR) for HumeLink on 29 July 2021 that meets the requirements of clause 5.16A.4, and which identified the preferred option to be a new 500kV double circuit transmission line in an electrical 'loop' between Maragle, Wagga Wagga and Bannaby (i.e., 'Option 3C').
2	The RIT-T proponent must obtain written confirmation from AEMO that: <ul style="list-style-type: none"> NER, clause 5.16A.5(b)(1): the preferred option addresses the relevant identified need specified in the most recent ISP and aligns with the optimal development path referred to in the most recent ISP; and NER, clause 5.16A.5(b)(2): the cost of the preferred option does not change the status of the actionable ISP project as part of the optimal development path as updated in accordance with clause 5.22.15 where applicable. (This is the 'ISP feedback loop').	Transgrid received written feedback loop confirmation from AEMO on 19 May 2023 that its proposed Stage 1 (Part 2) capex for LLE meets the identified need in the most recent ISP, this being the 2022 ISP, and that its proposed HumeLink total Stage 1 (Part 1 and Part 2) cost remains part of the optimal development path at an updated total cost of \$632.9 million (\$2022-23), including \$383.3 million for Stage 1 (Part 1) approved in August 2022 and \$249.6 million (\$2022-23) for this Stage 1 (Part 2) forecast capex approved by AEMO.
3	No dispute notice has been given to the AER under rule 5.16B(c) or, if a dispute notice has been given, then in accordance with rule 5.16B(d), the dispute has been rejected or the project assessment conclusions report has been amended and identifies that project as the preferred option.	There are no outstanding RIT-T PACR disputes that have been given to the AER under rule 5.16B(c) regarding the HumeLink Stage 1 (Part 2) contingent project application received on 23 May 2023.
4	The cost of the preferred option set out in the contingent project application must be no greater than the cost considered in AEMO's assessment in requirement 2 above.	Transgrid's proposed Stage 1 (Part 2) capex \$226.7 million (\$2022-23) is no greater than the \$249.6 million approved by the AEMO's feedback loop confirmation. Total Stage 1 capex (Part 1 and Part 2) in this application is within the updated Stage 1 cost cap of

		\$632.9 million (\$2022-23), set out in AEMO's feedback loop confirmation. ¹⁹
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Source: AER analysis.

We are also satisfied that the Transgrid's HumeLink Stage 1 (Part 2) contingent project application we received, and the supporting and explanatory materials we requested, are consistent with the requirements of AER's regulation of actionable ISP project for staged ISP project. They are also consistent with its previous approved HumeLink Stage 1 (Part 1) contingent project application.

¹⁹ AEMO, *Integrated System Plan Feedback Loop Notice – HumeLink (Early Works) – 19 May 2023*, 19 May 2023. See <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/integrated-system-plan-feedback-loop-notice>

4 Prudent and efficient project expenditure

This section outlines our assessment of Transgrid's proposed forecast capex for HumeLink early works Stage 1 part 2 and our determination on the prudent and efficient expenditure reasonably necessary to undertake this project.

The forecast capex is a key component to determining the incremental revenue Transgrid may recover over the 2023-28 regulatory control period. The forecast capex will also be added to the target capex for Transgrid's expenditure incentive schemes.²⁰ Any incentive rewards and penalties Transgrid receives as a result of under or overspending on the project will be applied as additional revenue adjustments in the next regulatory control period.

4.1 Forecast capital expenditure

Transgrid's CPA forecasts that stage 1 part 2 will require \$226.7 million (\$2022-23) in capex.²¹ Table 3 sets out our determination on the total capex required for the procurement of LLE in each year of the 2023-28 regulatory control period and the last year of the previous 2018-23 regulatory control period. We have accepted Transgrid's proposed forecast capex of \$227.9 million for 2023-24 and 2024-25. For the purpose of our assessment in section 4, we have referred to Transgrid's forecast as \$227.9 million, as this is the capex that is relevant to works undertaken for Stage 1 (part 2).

We have not included Transgrid's negative capex adjustment in 2022-23 section 4 as this adjustment does not relate to activities for Stage 1 (part 2). More information on our assessment of the negative adjustment is in section 5.

Table 3 shows our decision on the proposed capex, by year.

Table 3 AER determination of forecast capex (\$m, 2022-23)

	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Proposed capex	(1.1)	102.1	125.8	-	-	-	226.7
AER decision	-	102.1	125.8	-	-	-	227.9

Source: Transgrid, A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application, 23 May 2023, p.22.

Note: Numbers may not add up due to rounding. Excludes equity raising costs. The negative figure for 2022-23 is due to reducing estimated spending between CPA stage 1 part 1 and part 2.

Transgrid states that its proposed LLE procurement will deliver on the following three key objectives:

- Providing greater cost certainty for customers by locking in prices now²²
- Protecting against future inflationary pressure to ensure the Project is delivered at the lowest sustainable cost, and²³

²⁰ The Capital Expenditure Sharing Scheme (CESS) and the Efficiency Benefit Sharing Scheme (EBSS).

²¹ Transgrid, A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application, 23 May 2023, p.4

²² Transgrid, A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application, 23 May 2023, p.1

²³ Transgrid, A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application, 23 May 2023, p.1

- Securing supply-chain availability, in a competitive global market, in order to meet AEMO’s target delivery date of July 2026.²⁴

Transgrid’s CPA included a range of supporting documents: a detailed scope of work document, a detailed breakdown of the project cost elements and delivery date, a capex forecasting methodology, and an outline of its procurement process. It also provided an independent engineering verification and assessment of its capex forecast.²⁵

Overall conclusion on Transgrid's proposed capex

Based on our analysis of the available information, we consider that Transgrid’s proposed \$227.9 million (\$2022-23) capex is a prudent and efficient estimate of the forecast capex for the delivery of HumeLink early works stage 1 part 2. In addition, we note Transgrid’s forecast capex is within the amount included in the confirmation of AEMO’s feedback loop of \$249.6 million.²⁶

Our decision is to accept Transgrid’s forecast capex for the purchase of LLE for HumeLink, on the basis that it would reasonably likely be incurred by an efficient and prudent operator to deliver this project. In particular:

- Transgrid’s proposed scope and equipment ratings for LLE procurement for HumeLink are reasonable as a whole and adopt a prudent approach to meeting the objectives of early works for HumeLink.
- Transgrid's methodology to forecast its proposed capex is largely consistent with its previous PACR report and approved Stage 1 (Part 1) Early Works CPA project scope. The LLE procurement governance and early contractor involvement tender process for HumeLink, supported by Transgrid’s (PTT) procurement strategy, satisfies the requirements of AER’s regulation of actionable ISP project guidance note. We are satisfied that procurement is a critical step for project delivery by 2026-27.
- Transgrid provided additional information in response to our information requests. Based on the additional information for transformers and reactors, we consider Transgrid’s forecasts reasonable as these are actual contract costs and its new procurement processes are prudent and efficient.
- Transgrid also engaged consultants, Fission, to undertake independent technical verification and assumption of its steel tower and conductor unit rates and capex forecast for HumeLink, which it has endorsed. Based on our analysis against industry benchmarks on the quantities of assets and unit price, we consider the proposed cost forecast methodology is reasonable and likely to result in a reasonable estimate for forecast capex.
- We are broadly satisfied by Transgrid's claims this CPA will provide a benefit to customers through reducing cost uncertainty and mitigating delivery risk. We are also satisfied that the risk of sunk costs is mitigated by the likelihood that Transgrid will be able to resell the LLE assets if HumeLink does not proceed.

²⁴ Transgrid, *A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application*, 23 May 2023, p.1

²⁵ Fission, *Transgrid-Fission-Fission Technical Memo-19042023-Confidential_sent to AER 23 May 2023*.

²⁶ AEMO, *Integrated System Plan Feedback Loop Notice – HumeLink (Early Works) – 19 May 2023*, 19 May 2023. See <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/integrated-system-plan-feedback-loopnotices>

Our decision has also been informed by Transgrid's engagement with us over the process. This has included information requests, workshops, and attending a meeting between Transgrid and the Transgrid Advisory Council (TAC) on 23 March 2023. Stakeholders at the meeting did not raise any issues. We note that we did not receive any submissions in response to this CPA. In addition, we have consulted AEMO in the making of our decision. This process has ensured we have all the necessary information to make a fully informed decision.

The remainder of this section sets out our findings in more detail about:

- Transgrid's proposed forecast capex for LLE procurement and the reason it is likely to reasonably reflect prudent and efficient expenditure
- why the proposed scope of works for LLE procurement is reasonable as a whole and adopts a prudent approach to meeting the objectives of early works for HumeLink, and
- why the claimed benefits to customers are largely reasonable and supported by Transgrid's evidence.

Transgrid's proposed scope of works for HumeLink early works stage 1 part 2 LLE procurement and its approach prudently meet the objectives of staging

Transgrid's proposed scope of works are reasonable. In addition, we are satisfied that if Transgrid commenced the procurement of the LLE as part of stage 2 instead of stage 1 part 2, then it would materially increase the risk of delay in the delivery of HumeLink.

Transgrid's proposed long lead equipment scope is largely consistent with its previous Project Assessment Conclusions Report (PACR) and approved stage 1 part 1 early works CPA project scope. We are satisfied that the costs in stage 1 part 2 are an extension of stage 1 part 1.

We consider the scope of work reflects activities that can be included in an early works CPA. This is because procurement activities are considered to be a part of early works in our Regulation of actionable ISP projects guidance note.²⁷ Our assessment also found that Transgrid's proposed scope and equipment ratings for LLE procurement for HumeLink are reasonable as a whole and adopt a prudent approach to meeting the objectives of HumeLink early works.

The LLE procurement governance and early contractor involvement tender process for HumeLink, supported by Transgrid's (PTT) procurement strategy, satisfies the expectations set out in our Regulation of actionable ISP project guidance note.

The procurement time and payment schedule are prudent, and the included manufacturing and delivery time forecast are largely reasonable for delivering the towers and conductors in full by February 2025, and the transformers and reactors in full at the end of 2025.

²⁷ AER, AER – Final - Guidance Note – Regulation of actionable ISP projects, March 2021

In examining the project scope, we have identified issues relating to project delivery timeframes. The proposed LLE delivery schedule for late 2025 indicates the whole project is on an accelerated work schedule.

We also acknowledge that earlier inclusion of LLE costs in early works may mitigate these types of delivery risks.

Transgrid's proposed forecast capex is likely to reasonably reflect prudent and efficient expenditure

We have found Transgrid's forecast capex is likely to represent an efficient and prudent amount of expenditure to deliver the proposed scope of activities in its application.

Transgrid included the following information to support its forecast:

- Actual procurement costs (for transformers and reactors) for contracts Transgrid has already entered into.
- Estimates developed by its consultant Fission for the equipment that has not yet been contracted for (towers and conductors).

The total cost of the 2 early works contingent projects is \$609.2 million. Transgrid claimed this will not change the total project cost and will bring the associated costs forward and reduce its stage 2 cost by an equivalent amount. At this stage we are satisfied that the 2 early works stages have not increased the total cost of HumeLink. However, we will assess this in more detail as part of our stage 2 assessment.

We note that stage 1 part 1 included \$27.2 million for LLE, this brings the total cost of LLE to \$253.9 million (\$2022-23). We are satisfied that the costs that were previously approved have not been included in stage 1 part 2. However, we have assessed the total cost of LLE from both stages to ensure that the total costs for these assets are prudent and efficient.

We consider Transgrid's forecast for transformers and reactors to be efficient as we consider Transgrid's new procurement practices are prudent and efficient. Transgrid's procurement methodologies reflect new innovations in risk sharing that have resulted in lower costs than its older procurement models used in other large projects such as EnergyConnect. We consider the detailed information on procurement and delivery plans appeared to be reasonable.

For steel towers and conductors, we have undertaken a bottom-up assessment of the unit rates and volumes. We have reviewed the assumptions from Fission's independent cost and technical report which are based on the outcome of stage 1 part 1 early contractor involvement tender process and design reports. Additional consultant data provided in information request responses showed that the estimates are largely within a reasonable market price range.

We note that some elements of Transgrid's forecast reflect the higher range of forecasts and in some instances above current market rates. We consider that due to the nature of early works, there is a greater forecast uncertainty in providing early forecasts. This uncertainty is increased due to current market conditions where there has been higher price fluctuations. We are satisfied in this circumstance that a forecast that is slightly higher than current market conditions would result in a lower overall cost as it provides certainty to Transgrid to deliver HumeLink. We note that there is a risk that if Transgrid were to procure these assets later,

then the costs may be higher in stage 2. We consider this early works process should result in overall lower costs for the whole project. We expect Transgrid to reflect the benefits of stage 1 part 2 in its stage 2 forecast to ensure that consumers do benefit from this early works stage.

There may be cost differences between the forecast and actual contract costs once they have been signed. We are satisfied that this is unlikely to result in a material change of overall costs for consumers if Transgrid's stage 2 forecasts reflect any of these differences to ensure that consumers benefit from stage 1 part 2. We expect Transgrid to update its stage 2 forecasts to reflect any differences in contract costs.

Transgrid's claimed benefits of this contingent project application to include long lead equipment procurement in the early works stage are reasonable

We have reviewed Transgrid's objectives, identified in section 4.1, and whether they provide benefits to customers. We are largely satisfied by Transgrid's evidence. We note that due to the timing of the CPA, the benefits have not been fully quantified. However, we consider qualitatively the benefits identified by Transgrid appear to be reasonable. Through our ongoing engagement with Transgrid we expect the stage 2 CPA to include the benefits and outcomes of both early works CPAs.

We consider the benefit of locking in costs earlier is reasonable where uncertain market conditions such as supply-side issues are likely to result in costs being more likely to increase overtime, rather than decrease. We are also satisfied that the risk of asset stranding if HumeLink does not proceed is mitigated as these assets can be used in other projects by Transgrid or resold to other 500kV level transmission line projects.

We found the benefit of securing supply chain availability is crucial for the timely delivery of the HumeLink project. The LLE manufacturing and delivery time estimate also have a direct impact on the project construction planning and delivery management plan in the stage 2 application.

We consider that the primary benefit to the system and customers are the avoidance of a further delay in the completion of works due to supply and manufacturing constraints. There are many factors that could result in delays in completing HumeLink and this process mitigates a key project delivery risk. Had these costs been included in Transgrid's stage 2 application, it is possible there would not be sufficient time for Transgrid to procure its LLE.

Our analysis also indicates the benefit of cost certainty claimed by Transgrid is dependent on market conditions and the true benefit of LLE is to avoid project delay risk. We estimate that if there is more than a 10% to 15% chance that the project will be delayed by 1 year (or more) then the cost of the LLE is less than the reduction in benefits to customers.

We are satisfied that the risk of sunk costs as a result of earlier LLE procurement is mitigated by Transgrid's expectation that the LLE equipment can be resold at no decrease in value. We must be satisfied that the inclusion of extra costs for these assets do not result in a reduction in option value which is consistent with the intent for early works.

Given, the overall demand for LLE nationally, if the HumeLink project does not proceed to stage 2, Transgrid could repurpose those LLE assets internally for its other transmission

projects (such as VNI-West) or resell those LLE to other 500kV transmission projects nationally or sell in return for the underwritten funds.²⁸

We also consider the benefits of increased certainty through the staging process provides a more reasonable sharing of the risks and benefits between Transgrid and its consumers. This is because Transgrid can undertake tasks to progress HumeLink earlier than it otherwise would. Through this process Transgrid will also be able to produce more robust forecasts for Stage 2. We note that forecasts and the application of incentive schemes are closely linked in our ex-ante incentive based regulatory framework. We will have regard to the outcomes of the two early works contingent projects as part of our Stage 2 assessment on how incentive schemes should apply for HumeLink overall.

²⁸ Transgrid, *A.1 HumeLink – Stage 1 (Part 2) Contingent Project Application*, 23 May 2023, p.21.

5 Calculation of incremental allowed revenues

This section sets out our calculation of the indicative incremental revenue that Transgrid would recover from customers over the 2023–28 period to account for our determination of efficient project costs. We have applied an annual building block revenue approach, in accordance with clause 6A.8.2(h) of the NER. Transgrid's application is consistent with this approach.

Table 4 shows Transgrid is to recover \$38.7 million (\$ nominal) in additional revenues for HumeLink stage 1 part 2 from customers over the 2023–28 period.

As a result of recovering these revenues, we estimate that the transmission component of an indicative residential electricity bill in New South Wales²⁹ would increase by \$1.1 per year over the remaining four years of the 2023–28 period (2024–25 to 2027–28).

The total impact of HumeLink early work (including both part 1 and part 2) on the transmission component of an indicative residential electricity bill in New South Wales would be \$3.7 per year over the remaining four years of the 2023–28 period (2024–25 to 2027–28).³⁰

Table 4 Indicative incremental revenue calculation – HumeLink stage 1 part 2 (\$m, nominal)

	2023–24	2024–25	2025–26	2026–27	2027–28	Total
Return on capital	0.0	6.1	14.3	14.5	14.9	49.8
Return of capital ^a	0.0	-3.8	-1.8	-1.7	-1.6	-9.0
Straight-line depreciation ^b	0.0	-0.7	5.3	5.5	5.6	15.8
Less: inflation indexation on opening Regulatory Asset Base (RAB)	0.0	3.1	7.2	7.2	7.3	24.8
Operating expenditure	0.0	0.1	0.1	0.1	0.1	0.4
Revenue adjustments	0.0	0.0	0.0	0.0	0.0	0.0
Net tax amount ^c	0.0	0.1	-0.7	-0.6	-0.5	-1.8
Annual building block revenue requirement (unsmoothed)	0.0	2.5	11.9	12.3	12.8	39.5
Annual expected maximum allowed revenue (smoothed)	0.0	9.1	9.5	9.8	10.2	38.7
Increase to annual expected MAR (smoothed) (%)	n/a	1.0%	1.0%	1.0%	1.0%	0.8%

Source: AER analysis.

a Regulatory depreciation (return of capital) consists of straight-line depreciation net of indexation of the RAB. The negative incremental regulatory depreciation is a result of a higher growth in the RAB and the consequent increase in the indexation of the RAB exceeding the increase in the straight-line depreciation.

²⁹ The indicative residential customer electricity bill reflects the weighted average of AER's 2023–24 Default Market Offer prices for Ausgrid, Endeavour Energy and Essential Energy, using the number of customers in each distribution zone as the weights; AER, *Default market offer prices 2023–24 – Final decision*, 25 May 2023.

³⁰ The impact of HumeLink stage 1 part 1 on the transmission component of an indicative residential electricity bill in New South Wales was estimated to be \$2.6 per year over the remaining four years of the 2023–28 period; AER, *Amendment of Transgrid's 2023–28 Revenue Determination for HumeLink Early Works Contingent Project (Stage 1 Part 1)*, July 2023, p. 6.

b The straight-line depreciation in 2024–25 is negative because the as-commissioned capex for 2023–24 for HumeLink stage 1 part 2 is a negative amount.

c The negative tax amount in this decision is due to the growth in tax expenses, primarily the TAB and tax depreciation, being higher than the incremental increase in taxable income as a result of HumeLink stage 1 part 2.

Table 5 provides the effect of the resultant incremental increase in revenues on Transgrid's total annual building block revenue requirement (unsmoothed), expected maximum allowed revenues, and the X-factor over the remainder of 2023–28 period.

Table 5 Annual building block revenue requirement, expected MAR and X-factors (\$m, nominal)

	2023–24	2024–25	2025–26	2026–27	2027–28	Total
Annual building block revenue requirement (unsmoothed)	864.4	949.1	1018.8	1077.0	1087.6	4996.9
Annual expected MAR (smoothed)	924.0	960.1	996.0	1033.2	1071.8	4985.0
X-factors	n/a	–0.96%	–0.79%	–0.79%	–0.79%	n/a

Source: AER analysis.

Minor modelling issue regarding 2022–23 capex

As part of its application for HumeLink stage 1 part 2 contingent project, Transgrid proposed a negative adjustment of \$1.1 million (\$ nominal) for the estimated capex amount for 2022–23.³¹ This adjustment was proposed to reflect the best estimates at the time of its CPA.³²

In the amended AER final decision roll forward model (RFM) for HumeLink stage 1 part 1, we provided for a total of \$1,054.1 million (\$ nominal) as-incurred capex in 2022–23.³³ This reflects an estimated amount of capex for that year and is included in the opening RAB value as of 1 July 2023.³⁴

While the opening RAB value should be adjusted for any actual and estimated capex in 2022–23, such an adjustment will be made at the time of the 2028–33 transmission determination when the actual capex becomes available. This is consistent with the true-up process in the RFM and the requirements of the NER.³⁵ Therefore, we did not make any further updates to the estimated capex for 2022–23 in this decision. In its response to our information request, Transgrid agreed with this approach.³⁶

³¹ This is shown as a negative as-incurred capex for HumeLink stage 1 part 2 in 2022–23 in the proposed RFM for stage 1 part 2. Transgrid, A.1.2B - Transgrid 2023-28 - FD - RFM - April 2023 HL CPA-1B – PUBLIC.

³² Transgrid, *Email response to AER information request IR01 HumeLink stage 1 part 2 contingent project application*, 17 July 2023.

³³ AER, *Transgrid 2023-28 - Final decision - RFM - HumeLink Early Works - S1P1*, July 2023.

³⁴ AER, *Transgrid 2023-28 - Final decision - PTRM - HumeLink Early Works - S1P1*, July 2023.

³⁵ NER, cl. S6A.2.1(f)(3).

³⁶ Transgrid, *Email response to AER information request IR01 HumeLink stage 1 part 2 contingent project application*, 17 July 2023.

Glossary

Shortened form	Extended form
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CPA	Contingent Project Application
capex	capital expenditure
ISP	Integrated System Plan
kV	kilovolt
LLE	Long Lead Equipment
MAR	Maximum Allowed Revenue
NER	National Electricity Rules
ODP	Optimal Development Path
PACR	Project Assessment Conclusion Report
PTRM	Post-tax Revenue Model
PTT	Powering Tomorrow Together
PTRM	Post-tax Revenue Model
RAB	Regulatory Asset Base
RIT–T	Regulatory Investment Test for Transmission
TAC	Transgrid Advisory Council