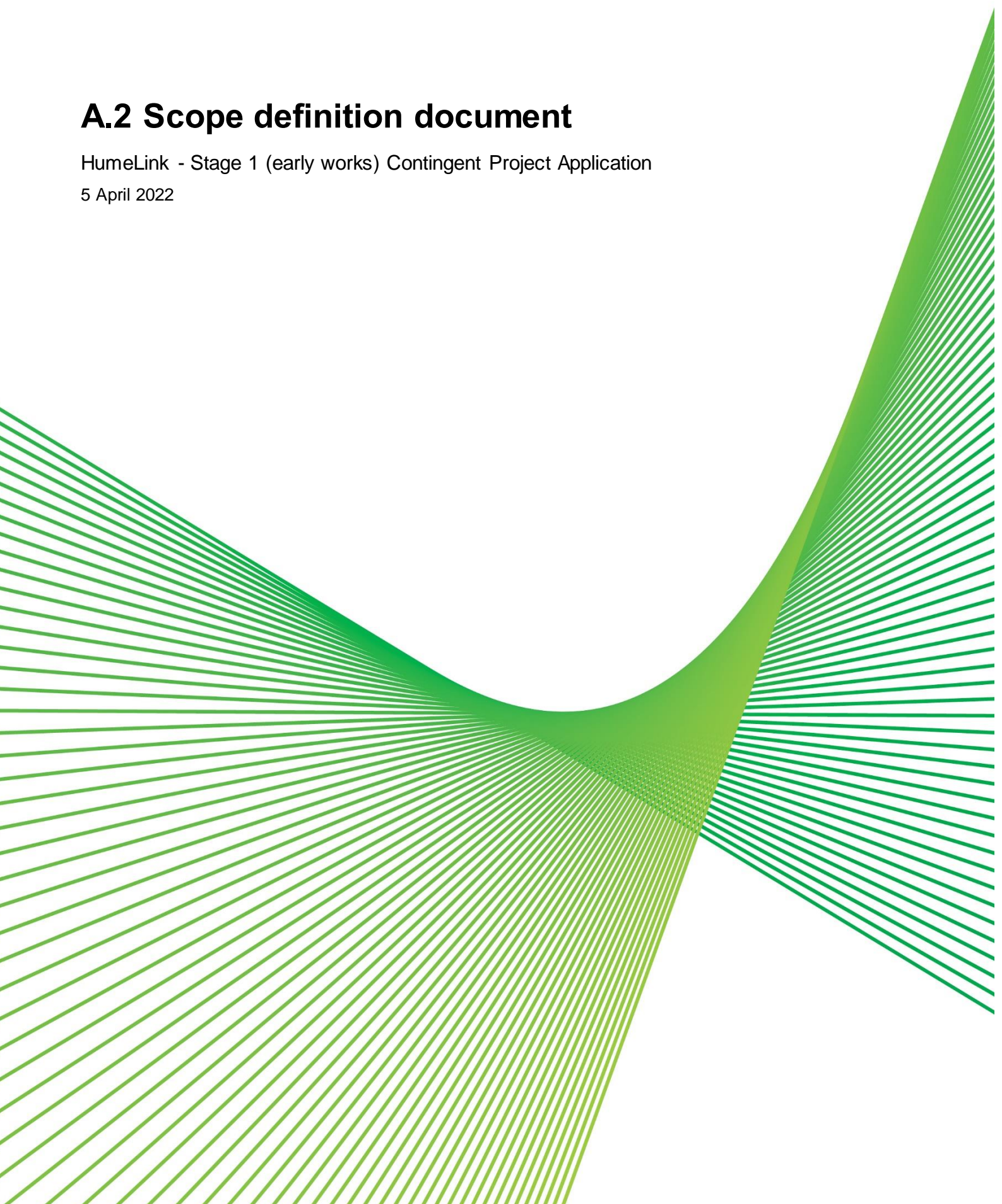


A.2 Scope definition document

HumeLink - Stage 1 (early works) Contingent Project Application

5 April 2022



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1. Introduction

This document forms part of our Contingent Project Application to the Australian Energy Regulator (AER) for early works (Stage 1 Application or CPA) for HumeLink (the Project or HumeLink).

The purpose of this document is to:

- overview the scope of our Stage 1 (early works) activities
- describe how our Stage 1 (early works) activities will:
 - determine the prudent and efficient construction cost for Stage 2 (project implementation)
 - identify, explore and manage our project risks, and
 - enable us to remain on schedule to achieving the Australian Energy Market Operator's (AEMO) Draft 2022 Integrated System Plan (Draft 2022 ISP)¹ target delivery date of 2026-27.²
- describe the scope and resources required for Stage 1 development and approval (D&A) activities, and
- explain and justify the resources required for the D&A work streams.

This document should be read in conjunction with our Principal Application document and other supporting documents, in particular our Capex Forecasting Methodology.

1.1. Structure of this document

The remainder of this document is structured as follows:

- Chapter 2 overviews AEMO's definition of Stage 1 (early works) and the scope of our Stage 1 activities. It also explains how our Stage 1 activities will:
 - determine the prudent and efficient costs for delivering the Project
 - identify, explore and manage our project risks, and
 - achieve AEMO's target delivery date of 2026-27.³
- Chapter 3 overviews the Stage 1 work program scopes, resources and deliverables.

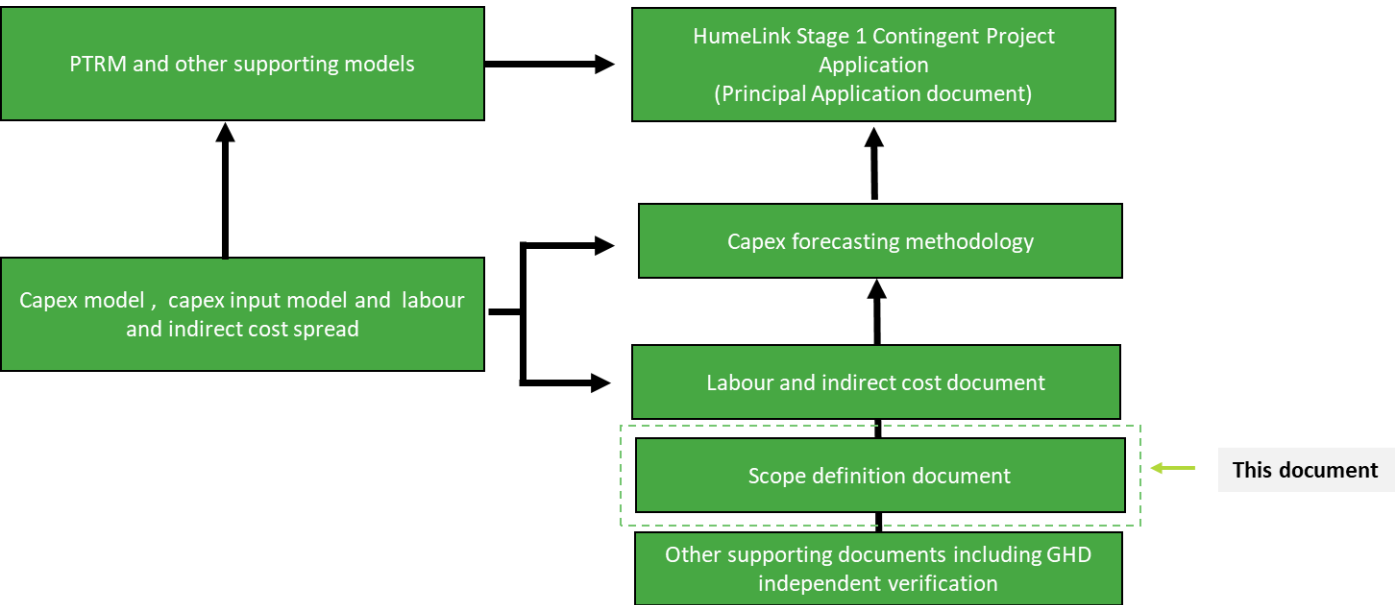
Our Stage 1 Application is structured as illustrated in Figure 1.1 to be as clear and accessible as possible to the AER, customers and other stakeholders.

¹ AEMO, [Draft 2022 Integrated System Plan](#) (Draft 2022 ISP), December 2021, p.13.

² AEMO, Draft 2022 ISP, p. 13 (see Table 1).

³ AEMO, Draft 2022 ISP, p. 13 (see Table 1).

Figure 1.1: Stage 1 CPA document structure for HumeLink



Attachments and supporting models comprising our Stage 1 Application are also detailed in section 1 of our Principal Application document.

2. The scope and specification of HumeLink Stage 1 (early works)

This chapter overviews AEMO's definition of Stage 1 (early works) and explains the scope of our Stage 1 activities. It also explains how our Stage 1 activities will:

- determine the prudent and efficient construction cost for Stage 2 (project implementation)
- identify, explore and manage our project risks, and
- achieve AEMO's target delivery date of 2026-27.⁴

2.1. AEMO's definition of Stage 1 (early works)

AEMO defines Stage 1 (early works) as pre-construction activities that can be undertaken now, while keeping open the option to continue, defer or cancel the project as new information becomes available.⁵ AEMO identifies the following activities as likely to fall within Stage 1 (early works) for HumeLink:⁶

- detailed engineering design – transmission line, structure and substation design, detailed engineering design and planning
- project initiation – this includes planning and design activities needed to accurately define the project, including pre-contracting activities for engineering, procurement and construction contracts such as obtaining binding bids
- cost estimation – finalisation, including quotes for primary and secondary plant
- land-use planning – to identify and obtain all primary planning and environmental approvals, route identification, field surveys, geotechnical investigations, substation site selection, easement acquisition and preparation of option agreements with landowners, and
- stakeholder engagement – with local communities, landowners and other stakeholders.

AEMO has issued us with a direction in its Draft 2022 ISP to proceed now with Stage 1 (early works) to achieve the following benefits:⁷

- option value – it will allow us to deliver the project as soon as possible or defer it if circumstances change
- insurance value – it will mitigate the risk of schedule slippage and the risk of coal exiting faster than anticipated, and
- continual improvement value⁸ – it will refine the project through innovation and cost effective design in order to identify, explore and manage project risks. This will result in more accurate cost estimation and ensure the Project's costs are prudent and efficient.

⁴ AEMO, Draft 2022 ISP, p. 13 (see Table 1).

⁵ AEMO, [Feedback Loop Notice](#), 27 January 2022

⁶ AEMO, [Draft 2022 ISP](#), p. 66

⁷ AEMO, Draft 2022 ISP, December 2021, p. 80

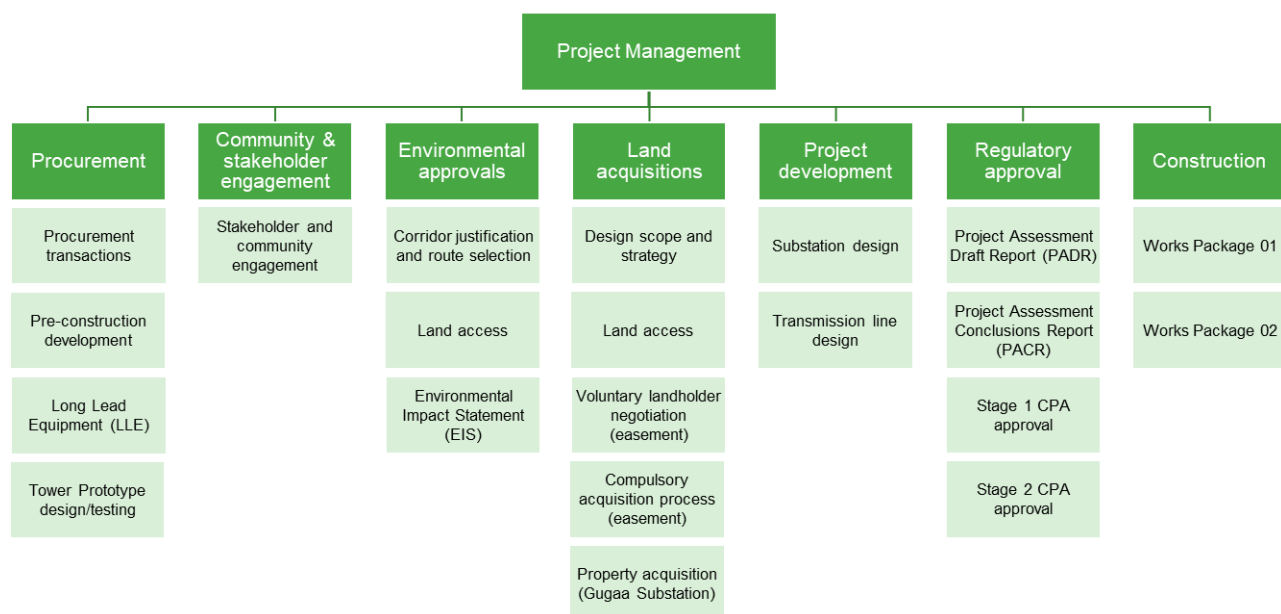
⁸ AEMO comments that further work to drive down project costs should be urgently undertaken as part of early works. AEMO, Draft 2022 ISP, December 2021, p. 12.

AEMO has assessed that undertaking early works now will avoid \$200 million of ‘regret costs’ from the project being delivered too late, due to schedule slippage or earlier than expected coal plant closures. AEMO therefore concludes that progressing Stage 1 (early works) is a low regret action for consumers.⁹

2.2. The scope of our Stage 1 (early works) activities

Figure 2.1 shows the Project’s work breakdown structure. The top line is our Stage 1 work programs, which is supported by more detailed work programs, processes and deliverables.

Figure 2.1 Project workbreakdown structure



Our Stage 1 (early works) activities comprise direct and indirect and labour capex activities.

- direct capex activities – these relate to procurement activities that will be undertaken by successful contractors appointed based on our ECI procurement process, as well as land acquisition activities including acquiring a site for Gugaa substation and establishing options agreements for transmission line easements
- indirect and labour capex activities – this relate to D&A activities.

The scope for the direct capex activities includes:

- pre-construction development work
- steel tower design and testing, and
- production slots for Long Lead-time Equipment (LLE).

⁹ AEMO, Draft 2022 Integrated System Plan (Draft 2022 ISP), December 2021, p.12.

These activities will be incorporated as separate portions (SP1) awarded to successful contractors as part of two Work Packages (WP 01 and WP 02). There is no other construction work included in Stage 1, however the planning, specification and procurement of construction works is included.

Table 2.1 shows how our Stage 1 (early works) activities map to AEMO's Stage 1 categories.

Table 2.1: Forecast capex categories alignment with AEMO draft 2022 ISP

AEMO draft 2022 ISP ¹⁰	Stage 1 CPA– Capex categories
Direct costs	
Direct early works which includes detailed engineering design for pre-construction works	Steel tower assembly design and prototype testing
	LLE
	Pre-construction works
	Land acquisitions
Labour and indirect costs (D&A activities)	
Project initiation/Cost estimation	Project management and project development
Project initiation	Procurement
Land-use planning	Land access and acquisitions and environment approvals
Stakeholder engagement	Community & stakeholder engagement
Project initiation	Regulatory approvals and other support costs

Table 2.2 shows how our capex for Stage 1 (early works) activities map to our work programs:

Table 2.2: Work programs and Capex Cost Categories

Category capex	Description	Work programs
Direct Capex		
Procurement	Steel tower assembly design and prototype testing	Procurement
	Long-lead equipment – Substation	Procurement
	Pre-construction development	Procurement
Land acquisitions	Valuation and land acquisition costs	Land acquisitions
Labour and indirect capex (Development & Approvals)		

¹⁰ AEMO draft Integrated System Plan 2022

Category capex	Description	Work programs
Labour and related costs		
Project team resources	Labour and corporate support for project management, development, procurement, land and environment activities	Across all work programs (includes Project Management)
Indirect costs		
Procurement	Bidder payments	Procurement
	Data room and transaction expenses	Procurement
	Transaction procurement support	Procurement
Project development	Development, engineering, legal and economic support	Project Development
Land and Environment	External labour, fees, and expenses	Land acquisitions and environmental approvals
Community and stakeholder engagement	External labour, fees, expenses, and social legacy initiatives	Community and stakeholder engagement
Regulatory approvals and other support costs	Labour, corporate support and indirect costs for regulatory RIT-T and CPA activities	Regulatory approval and related costs.

2.3. Our Stage 1 (early works) activities and outcomes

Our Stage 1 (early works) capex will deliver the following outcomes:

- determine the prudent and efficient construction cost for Stage 2 (project implementation) by refining the Project scope through innovation and cost effective design
- identify, explore and manage our project risks. This will allow us to mitigate and/or diversify the Project's risks so that residual risk costs included in our Stage 2 Application are as low as possible, and
- achieve AEMO's target delivery date of 2026-27 by ensuring that construction can commence as soon as possible following the approval of our Stage 2 CPA.¹¹

Table 3 details the nature of our Stage 1 (early works) activities and how they will contribute to achieving these three outcomes.

¹¹ AEMO, Draft 2022 ISP, p. 13 (see Table 1).

Table 3: Stage 1 (early works) activities – nature and outcomes

Category capex	Description	Nature and outcomes
Direct capex		
Procurement	Steel tower assembly design and prototype testing	We will need to complete the detailed design and testing of the towers prior to placing orders for steel. This means that we need to complete these activities in Stage 1 to meet the 2026-27 delivery date.
	Long-lead time equipment (LLE) – Substation transformers and reactors	Delivery of LLE is estimated to take 12-18 months following placement of orders. Payments for production slots are needed as part of Stage 1 to minimise the risk of project delays arising from delay in receiving LLE which may impact our ability to achieve AEMO's target delivery date of 2026-27.
	Pre-construction development – substation and transmission lines	<p>Pre-construction activities include detailed design work, equipment specification and quantities for plant and materials, project documentation and obtaining work permits.</p> <p>These activities will identify all pre-requirements for orders to be placed for the testing of towers, LLE and other plant and materials, such as conductors that have lead times of approximately 12 months.</p> <p>This means that pre-construction activities need to be completed in stage 1 to meet the target delivery date of 2026-27. We also expect that pre-construction activities will drive efficiencies and innovation in the Project's design, thereby lowering the construction costs and risks in Stage 2.</p>
Land acquisitions	Valuation and acquisition costs including options to acquire easements and acquiring a site for Gugaa substation, and cultural heritage	<p>The Project requires the acquisition of easements over a substantial amount of land that impacts many landholder properties. Land access is a critical step to enable construction to commence. It involves:</p> <ul style="list-style-type: none"> determining the compensation to be paid to each landholder establishing option agreements in order to be able to acquire land in Stage 2 commencing the compulsory acquisition process in the event amicable agreements cannot be reached with landholders undertaking surveys to identify and protect places of cultural heritage significance along the route, and securing a site for Gugaa substation so that designs can be undertaken to match the available site location, size and geotechnical conditions. <p>These activities need to be completed before we can commence construction. Our previous experience with land acquisition indicates that having a longer time period to negotiate with land holders reduces anxiety, the premium we need to pay and the potential for compulsory acquisition. This means that completing land acquisitions related activities in Stage 1 will lower the risk</p>

Category capex	Description	Nature and outcomes
		costs in Stage 2 and help meet the target delivery date of 2026-27.
Labour and indirect capex (Development and Approvals)		
Labour and related costs		
Project team resources	Labour and corporate support for project management, procurement, land and environmental activities	<p>Current and additional internal resources will manage development activities and prepare for the delivery of the Project. All development and approval activities are necessary to be completed to achieve an efficient and timely final investment decision (FID) to proceed with the Project following approval for our Stage 2 Application.</p> <p>This timing is critical to align FID and the unconditional execution of contracts so that Stage 2 construction works can proceed according to the critical path to achieve the 2026-27 completion date. Further, these activities will ensure that we manage delivery of Stage 1 in a prudent and efficient manner.</p>
Indirect Costs		
Procurement	Bidder payments	<p>These supporting procurement activities are needed to engage the contract market through the Early Contractor Involvement (ECI) process. Undertaking the ECI process in Stage 1 will:</p> <ul style="list-style-type: none"> • promote competition and innovation to lower costs including costs for risks for the construction works in Stage 2, and • enable the successful contractors to book production slots for LLE and undertake detailed design and other pre-construction activities in Stage 1. This will ensure construction can commence as soon possible following approval of our Stage 2 Application to meet the 2026-27 completion date.
	Data room services and market road show	
	Transaction procurement support	
Project development	Development, engineering, legal and economic support	<p>The following project development activities must be completed for construction to commence as soon as possible following approval of our Stage 2 CPA to meet the 2026-27 completion date:</p> <ul style="list-style-type: none"> • legal advice to support land acquisition, procurement and other work activities during Stage 1 • geotechnical reports and concept designs for contractors to prepare their pricing in the ECI process described above • an Owners Engineer to oversee the technical due diligence of the Project, and • other specialist studies to support development activities. <p>These activities and specialist resources will assist to drive cost efficiency and reduce risk costs.</p>

Category capex	Description	Nature and outcomes
Land and environment	Fees, labour and indirect costs	<p>Development of the Environmental Impact Statement (EIS), land acquisition, and related activities are scheduled to be undertaken between May 2021 to January 2023. They include:</p> <ul style="list-style-type: none"> EIS development work which is being led by Aurecon, including seasonal route surveys, the environmental scoping report, technical and route option assessments, and completion of EIS documentation an EIS application fee payable under the Environmental Planning and Assessment (EP&A) Regulation 2000 based on the capital investment value, and land agents and administrative support to lead the engagement with landholders and negotiations to establish options for easements and compulsory acquisitions. <p>These activities and specialist resources are needed in Stage 1 to meet the 2026-27 completion date. Further, the EIS will set out conditions of approval, including any actions we need to undertake to mitigate the Project's environmental impact. Completing the EIS in Stage 1 will therefore reduce risk costs in Stage 2.</p>
Community & stakeholder engagement	Stakeholder and community programs including social legacy ¹² , design and communication and community improvement	<p>The local community and landholders will be affected by HumeLink. In Stage 1 we need to implement the HumeLink Engagement Strategy (HES), including indigenous engagement and social impact engagements and initiatives, to improve stakeholder support for the project and meet stakeholder consultation expectations and requirements.</p> <p>These activities are needed to meet the target delivery date of 2026-27. We also expect that strong stakeholder support for the Project will reduce potential opposition, thereby supporting cost efficiency, including by reducing risk costs.</p>
Regulatory approvals and other support costs	RIT-T and CPA activities including document preparation, modelling and commissioning expert reports	<p>These activities are needed to prepare our regulatory submissions and seek the necessary regulatory approvals required before the Project can proceed.</p> <p>These activities are needed in Stage 1 to meet AEMO's target delivery date of 2026-27.</p>

¹² Social legacy seeks to leverage off the project building a more sustainable energy system – and through its strategic partnership approach, enabling more sustainable, resilient and future focused community programs. This includes community grants, youth traineeships, long-term jobs for indigenous communities, provision of 5G and digital communication.

3. Stage 1 CPA – work program scope, resources and deliverables

This Chapter overviews the Stage 1 work program scopes, resources and deliverables.

3.1. Project management

We have established a dedicated project team to oversee the delivery of the Project. The Project is led by a Project Director who is accountable for the Project's overall success.

Regular reporting to the Project Director is conducted through a Project Control Group (PCG) forum, which includes representatives leading the different work programs and corporate leads for safety, finance, and risk. The Project Director is the chair of the Project Control Group. The function of this group is to manage reporting and controls for the Project's development and delivery in accordance with our governance framework and requirements.

The scope of work and resources for project management and governance during the D&A phase includes:

- Project Director who is responsible for the project and is supported by the Project Delivery Manager and direct reports responsible for respective work programs
- support functions including HSE, risk management, project controls/scheduling, cost estimating, interface management, quality control, document control and administration support, and
- corporate support will provide additional resources for project management and the governance processes.

Activities completed to date include the RIT-T, stakeholder engagement, and further refinement of the preferred option. The total project leadership team and direct support will represent around 11 per cent of the total internal and external labour resources that will be required over the D&A phase (actual plus forecast).

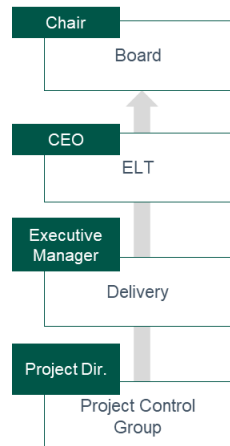
3.2. Project development

The project development work program comprises:

- two Program Managers - responsible for overseeing the development of the transmission line and substation designs respectively and managing teams of project managers.
- an Engineering Manager - responsible for ensuring the design services partners are meeting the requirements of the Project
- project development work – this included the original planning and scoping work for seven credible network options considered in the RIT-T process. Further work is being undertaken to produce concept designs and specifications. This will be provided to the contractors.
- cost estimators – responsible for preparing cost estimates at designated milestones during the D&A phase.

The project development team will be supported by external specialists including:

- engineering resources including an owners engineer, geotechnical and Light Detecting and Ranging (LiDAR) surveys and other specialist studies.



- construction and design specialists
- risk management specialists, and
- legal services and probity advice.

Table 3.1 overviews the objectives and deliverables for the project development work program.

Table 3.1 Project development workprogram - key objectives and deliverables

Project development	Objective and Deliverables
Develop a robust and efficient scope and specification	<ul style="list-style-type: none"> • Develop design briefs for design consultants and construction tenders. • Develop concept designs and specifications for transmission lines and substations for tenders. • Manage and support design contractors within the ECI procurement process to develop optimum engineering solutions and designs. • Engage an independent owners engineer to review engineering solutions and design quality. • Maintain and control document accuracy and design revisions.
Minimise design risk	<ul style="list-style-type: none"> • Balance the risk allocation with the Contractors. • Prepare concept designs (~ 25 per cent complete) with assistance from our design consultant at the time of tender. Detailed design will be the responsibility of the contractor(s). • Interface with EPC contractors on separate design scopes to ensure consistency of design across all contracts. Design will be completed during the early works phase prior to construction.
Ensure prudent and efficient costs	<ul style="list-style-type: none"> • Competitive market prices from the procurement process will support the prudence and efficiency of Stage 2 costs.

3.2.1. Resource requirements

The resources required for these deliverables have been determined based on a bottom-up assessment of the scope of work. Our experience on Project EnergyConnect and other large projects is that project development work typically represents around 25 per cent of the total labour and indirect costs during the D&A phase. The project development resources for HumeLink are expected to comprise around 27 per cent.

The project development requirements for the remainder of the D&A phase include:

- the project development managers overseeing the development of the transmission lines and substations.
- the project engineering team and specialist staff continuing to:
 - engage with network operations, planning, maintenance, and operations to consider the staging of construction work during the preparation of specifications and tendering for the construction works
 - support the teams conducting land surveys and acquisitions, environmental approvals, community and stakeholder engagement, and regulatory approvals

- engage with the asset management division to ensure the asset's full lifecycle is considered and issues resolved.
- the cost estimating team working with internal and external risk assessment specialists to refine the Stage 2 forecast costs and formally prepare cost estimates at designated milestones during the D&A phase.
- external engineering and specialist service providers will be engaged to:
 - prepare technical specifications for the procurement of equipment and materials for the Project
 - prepare technical specifications for tendering the design and construction of substations and the transmission lines
 - undertake risk assessments, scheduling and cost control for both the Stage 1 (early works) and for the proposed Stage 2 scope of work and costs
 - develop concept designs for the procurement of services for detailed design and ordering of LLE and materials
 - undertake geotechnical and LiDAR surveys, owner's engineering services and other specialist studies, and
 - provide legal services and probity advice.

Key parameters and drivers for the level of resources required for the project development scope are:

- route design and siting for around 927 transmission tower structures
- profiling and design of dual circuit 500kV towers (civil, structural and electrical) to support conductors over a route of around 365 kilometres of 500kV line and 15 kilometres of 330kV line
- concept designs prepared for different tower types and to specialised alpine conditions
- configuration, layout and concept designs (civil, structural and electrical) required for two new 500kV substations, and extensions/augmentation of another two substations, one at 500kV and another at 330kV
- requirements and specifications for large specialist equipment such as transformers and reactors and general substation equipment
- protection and control systems requirements and specifications required at each substation
- development and specification of requirements augmentation to other parts of the network because of this new network augmentation Project, and
- requirements and specification for access tracks and laydown areas.

3.2.2. Project development milestones

Table 3.2 overviews the key project milestones.

Table 3.2 Project development target milestones

Milestone	Expected timing
Stage 1 CPA submission	Apr 2022

Milestone	Expected timing
Transmission line concept designs complete for ECI tender (stage 3)	Mar 2022
Stage 1 CPA determination	Jun 2022
Substation concept designs complete for ECI tender (stage 3)	Jul 2022
All technical specifications complete for ECI tender (stage 3)	Aug 2022
Stage 1 FID approved	Jul 2022
Commence ECI tender (stage 3)	Sep 2022
Preliminary Geotechnical Investigation Complete	Dec 2022
Formal Tender Commences (Stage 4)	Feb 2023
Award Tender/ Instruct Early Works (SP-1)	Oct 2023
Optimal development pathway confirmation for Stage 2 CPA	Nov 2023
Stage 2 CPA submission	Dec 2024
Stage 2 CPA determination	Apr 2024
Final FID approved	Jun 2024

3.3. Procurement

The procurement work program includes:

- pre-construction work, paying deposits for LLE to secure supplier production slots, and for design and prototype testing of nine standard tower structures as part of the early works, and
- the procurement team labour and required specialists support needed for the ECI process including preparing and managing the ECI process, establishing and awarding contracts, and procuring Stage 1 (early works) activities.

Our procurement team, with the specialist support, will manage the transactions and the tendering process¹³.

We will engage the construction market early through an ECI procurement process to promote competition and innovation. We intend to award two packages for the design, construction and procurement of plant, consisting of a separate transmission line package and substation package or a combination of transmission lines and substations. This will be subject to the capacity and capability of the shortlisted contractors bidding for the work packages.

We will engage the construction market early through the ECI process to:

¹³ The procurement strategy and process are outlined in Appendix C in the supplementary document A.3 Capex forecast methodology.

- ensure greater cost certainty to support the Stage 2 CPA
- improve project definition and site information, capture innovations and identify risks opportunities, and
- provide assistance to progress the EIS.

We need to appoint contactors early to place orders for the LLE and to undertake detailed design work. Production and delivery of LLE is required for construction to begin sufficiently early to meet AEMO's target delivery date of 2026-27.

Production slots for LLE and prototype assembly and testing of nine standard tower designs will be placed by the successful contractors after equipment specifications and the quantities for the materials are determined during the tender phases prior Q4 2023.

Bidder payments will be made to unsuccessful tenderers to encourage the competitive participation of multiple bidders and support the considerable investment required of the bidders. These payments are in line with common industry practice and NSW government policy.

Table 3.3 overviews the procurement strategy objectives and deliverables.

Table 3.3 Procurement workprogram - key objectives and deliverables

Procurement	Objectives and Deliverables
Long-lead purchases	
<p>Power transformers and reactors have long lead time (12-18 months) and production slots will need to be established prior to approval of the Stage 2 CPA.</p> <p>Approximately 39,000 tonnes of steel will be required for the transmission line structures. Orders for the steel will need to be placed sufficiently early after approval of the Stage 2 CPA. Assembly designs and prototype testing of nine standard structures will be required in Stage 1.</p> <p>Conductors and other substation plant have long lead times and will also need to be ordered early after approval of the Stage 2 CPA.</p>	<p>Production of LLE needs to start in sufficient time to meet AEMO's target delivery date of 2026-27.</p> <p>Production options or positions will need to be booked with manufacturers (and deposits paid) to achieve the schedule.</p> <p>A Bill of Quantities for major equipment and materials will need to be determined for production to begin and this depends on detailed designs and specifications being sufficiently defined in Stage 1 (early works).</p>
Market capacity	
<p>HumeLink is the largest transmission project for NSW in recent times. The construction market is already experiencing record levels of spending which can stretch resources available to Contractors to deliver the Project.</p>	<p>The objective is to mitigate the impacts of potential market capacity constraints and action the procurement strategy to</p> <ul style="list-style-type: none"> • engage early with Contractors for market awareness and resource planning, and • award multiple construction contracts to diversify resource risk.
AEMO optimal development path	

A change to the Project's optimal development status by AEMO could result in delay of the Project following the Stage 1 CPA.

The objective is to manage the production and delivery of materials and equipment to minimise costs overall for the Project should the commissioning date be deferred 12 months while still providing delivery certainty to meet the earliest or a revised commissioning date.

Design procurement strategy

Design risk is the ownership of design liability and the completeness of design at contract award.

Different design delivery strategies can be more efficient depending on the size and complexity of projects.

The objective is to adopt an efficient allocation of design risk for this Project. This will be achieved by:

- our own design consultants preparing concept designs (~ 25 per cent complete) prior to tenders
- detailed design work will be completed by the successful contractors during Stage 1 (early works)

Contract strategy

Market participants vary in size and capability and the strength of tender responses can influence how works are packaged.

Some contractors are experienced in the construction of substations and transmission lines, while others are stronger in one or the other.

Market feedback has identified the need for bidders to have an in-depth understanding of the project prior to tendering to reduce risk premiums at time of tender, and bidders are also reluctant to invest in tendering if there is a risk of losing with no recovery of costs.

- Bidder payments will be paid to unsuccessful tenderers to encourage competitive participation of multiple bidders and supports the considerable investment and innovation required of the bidders.
- Contractors will lead detail design to mitigate risk of errors/omissions and allow for innovative construction solutions.
- Stage 1 (early works) will include long-lead purchases, the detailed design work, and prototype testing of towers

Section 3.3.1 to 3.3.4 overview the scope of each element of our Stage 1 procurement costs. This will be followed by Stage 2 (implementation), which has a Q3 2024 target commencement date and is subject to regulatory, planning, and funding approval. The current estimate for the duration of construction and commissioning phases in Stage 2 is approximately 2.5 years, with completion and handover of works targeted for Q4 2026.

3.3.1. Steel tower assembly design and prototype testing

The total number of towers in the early concept transmission line designs is 927 and this will comprise nine standard tower assemblies. Each of these tower types will require withstand testing by suppliers to ensure the required strength and the quality of steel being provided by the supplier will meet the design load requirements.

The steel supplier scope includes:

- tower design and detailing drawings
- steel supply for the prototype sections
- erection of towers

- tower load testing
- Management of the above work

Table 3.4 Transmission tower quantities and unit weights

Tower Type	Tower Qty	Unit Weight	Total Weight
500kV D/C Suspension	620	35.16	21,799
500kV D/C Tension	135	69.98	9,447
500kV D/C Suspension (Alpine)	106	43.95	4,659
500kV D/C Tension (Alpine)	26	87.47	2,274
330kV D/C Suspension	22	13.08	288
330kV D/C Tension	18	29.69	534
Total	927		39,000

3.3.2. Substation transformers and reactors (LLE)

The equipment and quantities were specified in the PACR are currently unchanged as follows:

- 7 x 500kV 150 MVar shunt reactors (which includes 1 spare) to be located at Gugaa
- 5 x 3 phase 1500MVA 500/330/34.5 kV power transformers (plus 1 single phase spare to be located at Gugaa – 16 single phase units in total)

The numbers of plant above corresponds to the quantities used in the basis of estimates in the capex forecast for LLE.

Stage 1 (early works) involves payment of deposits for LLE to secure supplier production slots. The timing of this step is critically linked to the awarding of work packages in the procurement process and subsequently the confirmation of specifications and designs as part of the pre-construction works.

3.3.3. Pre-construction works

Detailed substation designs will be required for:

- expansion of Maragle 330kV switching station 500 kV including three new 500/330/33 kV 1500 MVA transformers and provision for two 500 kV double circuit transmission line bays
- a new Gugaa 500/330 kV Substation in the vicinity of Wagga Wagga Substation including two new 500/330/33 kV 1500 MVA transformers
- augmentation of the existing Bannaby 500/330 kV Substation to include two additional 500 kV double circuit transmission line bays
- augmentation of the existing Wagga 330 kV Substation to include additional 330 kV double circuit transmission line bays.

The preliminary design configurations and plant required for the above substations has formed the basis for estimating the forecast capex for the pre-construction work for substations.

Detailed transmission line designs will be required for:

- a 500 kV double circuit transmission line from the existing Bannaby 500 kV Substation to a location near Blowering Dam.

- a 500 kV double circuit transmission line from the Blowering Dam location to the Maragle 500 kV Substation
- a 500 kV double circuit transmission line from Blowering Dam location to the new Gugaa 500 kV Substation
- a 330 kV double circuit transmission line from new Gugaa 500/330 kV Substation to existing Wagga 330 kV Substation

The pre-construction work will also require contractors to complete the following activities:

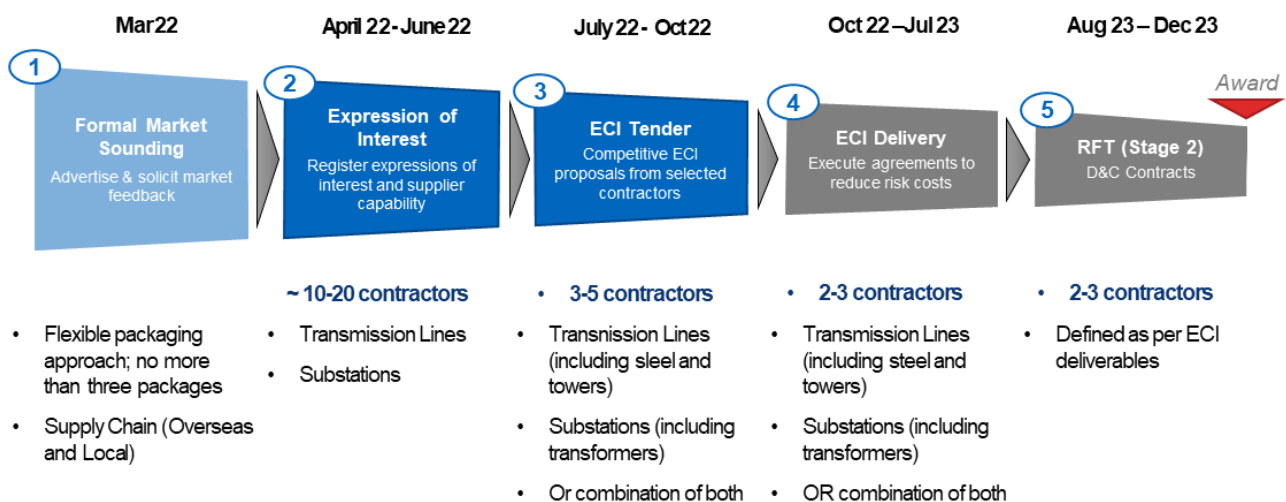
- develop management plans and associated documentation
- manage resourcing and scheduling of the pre-construction work
- manage planning, resourcing and scheduling of Stage 2 construction work
- manage the procurement of the LLE and steel tower type testing
- obtain the necessary work permits and engaging with stakeholders relevant to the construction of the Project, and
- undertake site surveys to support the detailed design work and above activities

3.3.4. Transaction Procurement (indirect costs)

A procurement team has been established to develop and implement the procurement strategy.

Figure 3.1 shows the five procurement phases which correspond to Stage 1 (early works). Stage 2 CPA is scheduled for the end of Q4 2023.

Figure 3.1 Procurement process and timeline



Our procurement approach is set out in Appendix B of our Capex Forecasting Methodology.

3.3.5. Resource requirements

The resources required for transacting the procurement work program comprise internal labour, an average of seven FTEs, supported by external contracted resources.

The external resources and related indirect costs include:

- probity advisor – who will be engaged throughout the Contract Program and will provide Probity Mindset Training as part of the probity framework
- independent experts – three experts will be engaged for twelve days to review data. This is consistent with good industry practice and in line with our procurement process for Project EnergyConnect
- additional FTEs – to facilitate the ECI delivery phase, RFT preparation and interactive workshops
- bidder payments – these are payments to unsuccessful bidders for participating in the process
- data room services – these are required to manage transactions, document control, tender submissions, and tender evaluation within a confidential controlled system. This is consistent with our procurement process for Project EnergyConnect, and
- other external resources – additional resources to support transactions with any international contractors, market research and resources for venues, catering, travel and accommodation.

Key parameters and drivers for the level of resources required for procurement transactions are:

- the specific work program activities involved in each stage such as market sounding, the ECI delivery phase, tender preparation, managing the tender and evaluation of tenders.
- the comparative complexity of the project scope and project risks
- the number of contractors shortlisted, and
- the number of tender phases.

3.3.6. Procurement milestones

Table 3.5 overviews the procurement milestones for Stage 1 (early works).

The Stage 1 timeline is shown in section 6 of our Capex Forecast Methodology. This demonstrates that the procurement activities are on the critical path to construct and commission the Project by 2026-27.

Table 3.5 Procurement milestones

Milestone – Stage 1 (Early Works)	Expected timing
Stage 1 Market Scanning commences	Nov 2021
Market Sounding Complete (stage 1)	May 2022
EOI Market Capability exercise commences (stage 2)	Jun 2022
Pre-Tender ECI commences (stage 3)	Sep 2022
RFT phase commences - schedule constraint (stage 5)	Feb 2023
RFT phase Tender closes (stage 5)	Jun 2023

Milestone – Stage 1 (Early Works)	Expected timing
Contract Award (SP1 – Stage 1 Pre-Construction works and LLE)	Oct 2023
Contract Award (SP2 - Conditional Stage 2 Construction)	Nov 2023
Pre-construction works commences	Nov 2023
LLE (Transformers & Reactors) supply awarded, and production booked – schedule constraint	Mar 2023
Steel & Towers – place tower design and testing orders – schedule constraint	Apr 2024
Stage 1 Pre-construction work complete	Jun 2024
Stage 2 FID – schedule constraint	Jun 2024
Stage 2 Construction commences – schedule constraint	Aug 2024
Stage 2 Commissioning completed – schedule constraint	Dec 2026

3.4. Land acquisitions

Approximately 365 kilometres of new double circuit 500kV transmission lines will be constructed requiring 70 metre wide easements to be created over the line routes. Around half of the new transmission lines will be built parallel to existing transmission infrastructure with widening of existing easements required over parts. A new site must be acquired approximately 15 kilometres east of the existing Wagga Wagga 330kV substation for the construction of a new Greenfield 500/330kV substation.

Land acquisitions will therefore be required for:

- the freehold purchase of 90 hectare site (approximately) for the new Gugaa 500/330 kV substation
- easements for the 330 kV transmission line between Gugaa substation and the existing Wagga Wagga Substation (15 kilometres)
- easements for 500 kV transmission line connections consisting of three segments; one from the existing Bannaby substation to the tee-off point in the Blowering area (~230 km); a second from the tee-off point to the future Maragle substation¹⁴ (~60 km); and the third from the tee-off point to the proposed Gugaa substation (75 km).
- road easements for permanent access tracks

Based on the current indicative transmission line routes it is expected that 362 landholders will be directly affected by easement acquisition requirements. We have progressed engagement with landholders based upon the indicative route and broader study corridor. Land access is critical to enable construction to start following the approval of our Stage 2 CPA.

¹⁴ The future Maragle substation is to be delivered as part of the Snowy Connection Transmission Project

The key success factors are:

- early landholder consultation, reasonable land valuations and genuine negotiations to minimise compulsory acquisition
- accurate and efficient refinement of the easement corridor to specific property requirements
- certainty of property costs prior to Stage 2, and
- alignment of the land acquisition schedule with construction site access to avoid delays and contract disputes.

Securing the new Gugaa 500/330kV substation site as part of the early works is a critical element to ensuring the Project can progress as planned and designs can be undertaken to match the available site location, size and geotechnical conditions.

There are related services and costs directly related to land acquisitions including:

- cultural heritage services
- our costs to cover landholders' own legal and valuation services
- our direct land valuation services, and
- Valuer General fees.

We have a dedicated team focussing on the land acquisitions work program.

Table 3.6 overviews the objectives and deliverables for land acquisition work program.

Table 3.6 Land acquisition work program key objectives and deliverables

Land acquisitions	Objectives and Deliverables
<p>The Project requires the acquisition of easements over a substantial amount of land, which impacts many landholders, to provide construction site access. Property access is required following the approval of our Stage 2 CPA to allow construction to proceed.</p> <p>To ensure site access as soon as possible, we need to establish early option agreements to secure a future acquisition, and to commence any compulsory acquisition process prior to FID.</p> <p>We have progressed engagement with landholders based upon the indicative route and broader study corridor. There are 362 landholders that we need to negotiate with for an easement.</p>	<p>Our objective are:</p> <ul style="list-style-type: none"> • ensure landholders have been satisfactorily engaged and are agreeable with the outcomes of negotiations • establish early option agreements for transmission line easements • commence necessary compulsory acquisitions prior to commencing Stage 2 activities • acquire the Gugaa substation site • ensure cultural heritage surveys and plans meet the requirements of the relevant government agencies and indigenous stakeholders <p>Achieving the above is critical to:</p> <ul style="list-style-type: none"> • ensure immediate site access after approval of the Stage 2 CPA • avoid any delays to the commencement of the construction works.

Land acquisition process

Our property acquisition process is guided by the NSW *Land Acquisition (Just Terms Compensation) Act 1991*. Under the Act, acquisition can be by agreement or compulsory acquisition. The acquisition process must be a fair and transparent process with appropriate engagement and negotiation undertaken before compulsory acquisition can be considered as a last resort.

Figure 3.2 overviews the process for acquisition by negotiation with landowners.

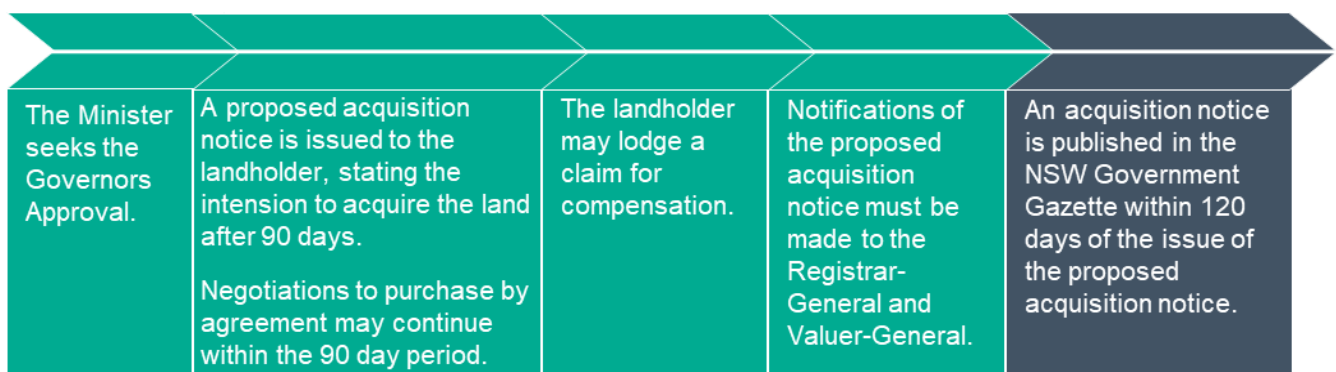
Figure 3.2 Acquisition process by negotiation with landholder



To align the timing of funding approval and construction site access, we will seek to negotiate and enter into property option agreements with willing landholders. These conditional contracts are an agreement for us to acquire an easement over the land at a pre-agreed value at a future date. This approach will deliver greater certainty for the implement costs of the Project and will reduce the time to access site for construction once funding is approved.

If an agreement cannot be reached, we have the option of compulsory acquisition under the *Land Acquisition (Just Terms Compensation) Act 1991* with the approval of the Governor. The Act sets out a process that must be followed. The compulsory acquisition process is generally as shown in Figure 3.3.

Figure 3.3 Compulsory acquisition process



3.4.1. Resource requirements

In summary the level of management resources and the direct project costs for land acquisitions is driven by four key factors:

- 1) 365 kilometres of transmission line route requiring cultural heritage surveys.
- 2) 362 impacted landholders will require individual consultation and negotiations to determine land valuation i.e. the level of compensation to be paid. The level of resources required is similar to that required for the eastern section of Project EnergyConnect, being more densely populated and with similar land uses.

- 3) 287 private landholders will need to be engaged to establish option agreements to secure future acquisitions. No all private landholders will accept the final offer for acquisition. We have estimated that 115 will choose to negotiate through compulsory acquisition.
- 4) 130 of the landholders are expected in total, including all Crown and statutory authority landholders, to need valuations determined by the Valuer General and the level of engagement and negotiations by the team included in estimates.

3.4.2. Land acquisition milestones

Table 3.7 shows the land acquisition target milestones.

Table 3.7 Land acquisition milestones

Milestone	Expected timing
Commence issue of Letters of Offer (including Option Agreements) for easements	Jul 2022
Gugaa substation land acquired	Oct 2022
Complete Option Agreements for easements	May 2023
Commence compulsory acquisition for easements (Valuer General)	Oct 2023
Finalise Compulsory Acquisition List	May 2024
Stage 2 FID – schedule constraint	Jun 2024

The actual acquisitions for easements will be completed in Stage 2 and will follow the key milestones and constraints shown in Table 3.8 as follows.

Table 3.8 Land acquisition key dates following FID-2

Milestone	Expected timing
Proposed Acquisition Notices (PANs) commenced	Jun 2024
Pay Compensation for Voluntary Easements	Jun 2024
Registration of voluntary easement acquisition complete	Sep 2024
Registration of compulsory acquired easements	Oct 2024
Contractor Possession of Site commences – Schedule Constraint	Aug 2024
Compulsory acquired compensation for easements commenced	Feb 2025
Compulsory acquired compensation for easements completed	May 2025
Contractor access over entire transmission line routes – schedule constraint	Jun 2025

3.5. Environmental approvals

The size of the Project as well as the terrain and the geographical expanse that it covers, means that it will have substantial biodiversity impacts. Significant resources are required to manage environmental implications of the Project. In particular, we must follow the established frameworks to avoid, minimise and offset impacts through the NSW Biodiversity Offsets Scheme.

Table 3.9 overviews objectives and deliverables for this scope of work.

Table 3.9 Work program key objectives and deliverables

Planning approval/biodiversity offsets	Objectives and Deliverables
<p>The impacts from changes during the planning approval process, or obligations within the conditions of consent, can significantly impact construction contract time and cost if they are not incorporated in the competitive tender phase.</p> <p>We will need to follow the established framework to avoid, minimise and offset impacts through the NSW Biodiversity Offsets Scheme.</p>	<p>We must undertake a robust environmental impact assessment and develop a comprehensive EIS that ensures:</p> <ul style="list-style-type: none"> • potential environmental and social impacts are avoided or minimised • our biodiversity offsets credit obligation is accepted • net positive biodiversity outcomes are achieved, and • the delivery of planning and environmental approvals is met according to the project schedule.

The ecological surveys will inform the biodiversity assessment for the EIS and development of a biodiversity offsets strategy. Field surveys, technical assessments and the development of the EIS documentation are the primary requirements for environmental approvals.

These environmental services are being directed by a small team. The level of resources provided by Aurecon, with support from other specialist providers, is driven by the following key factors and needs:

- seasonal surveys of flora, fauna and ecological impacts, and including specific biodiversity impacts, over the routes of the proposed 365 kilometres of transmission lines
- the assessment of impacts and development of the EIS for this very significant size project and given the geographical expanse and potential impacts
- development of a biodiversity offset strategy to minimise the significant costs of biodiversity offsets obligations determined to apply to the Project
- construction environmental support, technical peer review and route options assessment/validation

The bulk of the work was competitively tendered. Aurecon (the successful tenderer) provided methodologies for each technical specialist area, the resources required and delivery schedule. The initial resources identified have been revised to meet a more precise known scope of work.

Environmental approvals are critical activities with critical independencies to other processes. The mitigation of the key risks for each process are provided in Table 3.10.

Table 3.10 Environmental approvals and property acquisition risk assessment

Risks to Project	Mitigation measures put in place
<ul style="list-style-type: none"> changes to project scope community opposition gaps in the EIS content 	<ul style="list-style-type: none"> Robust impact assessment by experienced environmental consultancy Early and ongoing community consultation and stakeholder engagement Construction expert advice to the proposed construction methodology

3.5.1. Resource requirements

The resource requirements for environmental approvals consist of:

- Work already commenced, including work by Aurecon for planning and undertaking seasonal route ecology surveys, the environmental scoping report under the NSW Environmental Planning and Assessment (EP&A) Act and a referral under the Environment Protection and Biodiversity Conservation (EPBC) Act
- Remaining work will predominately be undertaken by our contractor Aurecon and includes:
 - targeted threatened species surveys and heritage surveys
 - providing technical assessments for the EIS and input to route option assessments
 - completion of EIS documentation

EIS and Biodiversity requirements

The Project has been designated Critical State Significant Infrastructure (CSSI) given that it is part of the wider 'Snowy 2.0 and Transmission Project'. It therefore requires assessment and approval under Part 5, Division 5.2 of the NSW EP&A Act before it can proceed. The NSW Minister for Planning and Public Spaces is the determining authority for the Project.

The Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act provides that a proposed action (proposed project activities) requires approval if it has, will have, or is likely to have a significant impact on Matters of National Environmental Significance (MNES) or other matters protected under the EPBC Act. It is expected that the Project will be determined to be a 'controlled action' under the EPBC Act and therefore will require approval from the Commonwealth Minister for the Environment.

The EIS process under the NSW EP&A Act has been accredited under the NSW and Commonwealth Government's EPBC Act bilateral agreement for the assessment of the Project, which means the EIS process will support both NSW and Commonwealth Government processes. Further, potential impacts to MNES and the environment generally are considered throughout the EIS.

The EIS will include a suite of mitigation measures, as well as project commitments, which will be incorporated into various Construction Environmental Management Plans (EMPs) for the Project's delivery.

Construction EMPs will be prepared for the construction phases of the Project and will be prepared by Construction Contractors as part of the pre-construction works in Stage 1 ready for the construction works to begin in Stage 2.

The biodiversity assessment undertaken as part of the EIS will inform the development of the Biodiversity Offset Strategy. It will also provide guidance on how to deliver an offset portfolio that will realise conservation

outcomes that improve or maintain the viability of impacted biodiversity. The purpose of the strategy will be to identify an appropriate approach to managing project impacts which could not be otherwise avoided or minimised.

The NSW Biodiversity Conservation Act 2016 (BC Act) and the Biodiversity Conservation Regulation 2017 (BC Regulation) outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme.

As required, we will employ an accredited assessor to apply the Biodiversity Assessment Method (BAM). The accredited assessor will prepare a Biodiversity Development Assessment Report (BDAR) that will set out how the Project has applied steps to avoid and minimise impacts on biodiversity. The BDAR also describes the number and type of ecosystem and species credits required to offset residual impacts of the activity on biodiversity (credit obligation). The Project must submit the BDAR to the consent authority (DPIE) as part of their application.

DPIE will determine whether to approve or refuse the application against the legal and technical requirements of the BC Act, BC Regulation and the BAM.

If DPIE approves the application, the credit obligation (and any other actions required) will be included as conditions of the consent. DPIE has the discretion to increase or decrease the credit obligation generated by the BDAR. Other conditions may also be imposed to secure commitments in the BDAR that the Project has made to avoid or minimise impacts on biodiversity.

Once DPIE has issued the consent, that includes the final credit obligation, the Project will have three primary ways that they can satisfy this obligation:

- identify and purchase the required 'like for like' credits in the market and then retire those credits via the Biodiversity Offsets and Agreement Management System (BOAMS), e.g. using the registers or by retaining a broker to locate credits for them,
- establishing Biodiversity Stewardship Area sites through property purchases
- use the offsets payment calculator to determine the cost of the credit obligation and transfer this amount to the Biodiversity Conservation Fund via the BOAMS. The Biodiversity Conservation Trust is then responsible for identifying and securing the credit obligation.

An estimate of the costs to retire the required biodiversity offsets will be prepared based on:

- the application of the BAM using data obtained from surveys of vegetation and other biodiversity impacts anticipated from construction and operations of the Project.
- determining the lowest cost options of the three primary ways to meet the determined credit obligations and
- an assessment of the risks in forecasting expected biodiversity offset costs

Confirmation of biodiversity offset costs will be developed in conjunction with the EIS process. These costs to the Project will be significant and are determined on the specific impacts assessed in accordance with the Biodiversity Conservation Act 2016 (NSW), and EPBC Act (Commonwealth).

3.5.2. Environmental approvals milestones

Table 3.11 overview the high-level milestone for the environmental approvals work program. The level of resources required for the deliverables linked to each of the key milestones are scheduled during the D&A phase to meet these targeted deliverable dates and schedule constraints.

Table 3.11 Environmental approval target milestones

Milestone	Expected timing
EIS technical studies and draft preparation commences	Aug 2021
Scoping report complete	Mar 2022
Revised 200m corridor published	Apr 2022
EIS technical studies and draft preparation completed	Aug 2022
Complete DPIE Adequacy Review and submit final EIS	Jan 2023
Public exhibition & submissions/DPIE and Commonwealth Review/EIS Approval commences	Jan 2023
EIS approval	Nov 2023
Stage 2 FID – schedule constraint	Jun 2024

3.6. Community and stakeholder engagement

Community and stakeholder engagement is critical to establish support for the Project. The landholders and communities that will be impacted by the Project need to be kept well informed of the benefits of the project and be provided information about the development, the construction and future operation of transmission line. Achieving fair and reasonable expectations amongst these stakeholders is an important aspect for the success of the Project including the level and style of engagement.

Table 3.12 overviews the objectives and deliverables for our community and stakeholder engagement work program.

Table 3.12 Community and stakeholder work program - key objectives and deliverables

Community and stakeholder engagement	Objectives and Deliverables
<p>Community and stakeholder engagement is a critical process to establish support for the Project from all stakeholders.</p> <p>Industry market participants, the Federal and NSW Governments, landholders, the community and indigenous groups are major stakeholders in the Project.</p>	<p>The objective is to establish support for the Project from all stakeholders. This will require the development and implementation of an effective stakeholder engagement plan and action plans for key engagement areas and stakeholders.</p> <p>The plan will aim to support efficient and timely delivery of consultation and engagement across a range of stakeholders for the Project.</p>

We have developed a HumeLink Engagement Strategy (HES) to outline our communication and engagement approach with communities, landowners and other key stakeholders in Stage 1 (early works). The HES refers to engagement activities for the period March 2022 to March 2023.

Figure 3.4 shows the four key engagement areas identified in the HES. Figure 3.5 shows how our Social Legacy communications will link to our social legacy strategy and its objectives.

Figure 3.4 Key engagement areas



Figure 3.5 Social Legacy key focus areas



Indigenous engagement

A critical aspect of our engagement is the need to plan and develop actions based on input from the Aboriginal and Torres Strait Islander community around their skills and needs, and to then consider what the Project has to offer and learn. Feedback is being used to help plan the route, minimise project impacts and maximise benefits for the Aboriginal and Torres Strait Islander community and the Project.

In line with our Aboriginal Participation in Construction Policy, we will include requirements in construction contracts for the development of participation opportunities and will set a minimum standards and targets of 2.5% to 5% based on the nature, location and objectives of the Project and community, and encourage the achievement of higher targets.

Social legacy

Another key aspect of the Project is social impact and legacy management. Our Corporate Strategic Plan, Energy Vision and Environmental and Social and Governance (ESG) principles as well our commitment as a signatory to the Energy Charter give an insight into our Social Legacy aspirations which embraces wider aims towards building a better community for all.

NSW and Federal Government policies currently target a minimum 3% project spend on indigenous employment and businesses, and for achieving social legacy outcomes/objectives. For Project EnergyConnect we are targeting 5% and for HumeLink we will aim to achieve a similar or higher investment over the course of the development and delivery phases of the Project.

HumeLink's Social Legacy Strategy aims to enable a lasting positive legacy in south western NSW and provide long-term community benefit and resilience through infrastructure. Initiatives developed as part of

this strategy will involve many key partners and stakeholders including local government, the Department of Regional NSW, TAFE's, Department of Education, DPIE, Training Services NSW, Local Aboriginal Land Councils, and several local community groups, universities and long term regional employers.

We have established a total of nine separate initiatives that will be funded.

The programs relate to areas that have a longer life beyond the construction of HumeLink such as electricity industry opportunities through education and youth pathways, creating opportunities for local contractor services, employment and education opportunities for indigenous communities, creating future leaders in the energy and renewable energy sector through tertiary education programs, and cultural community partnerships.

Our engagement in Stages 1 to 3 of our HES

The stakeholder team has focussed on implementing an initial community engagement plan covering stage 1 to 3 of the HES. Stage 1 has been associated with the wider study corridor affecting around 750 affected landholders and the wider community. Stage 2 has been a shorter information gathering phase of engagement with stakeholders now that the current corridor being assessed is 200 metres wide with 362 affected landholders.

We have engaged experienced contractors to provide the bulk of the resources to deliver community and stakeholder services. These contractors will work alongside our internal project team.

- **Stage 1 – Wider Corridor landholder and community engagement**

Community and stakeholder engagement commenced in March 2020, with the release of an indicative route corridor but was delayed soon after due to COVID-19 restrictions and re-commenced in September 2020. Landholder engagement has been strong with a range of questions and concerns expressed via written feedback and landholder forums.

This initial stage of engagement had been associated with the wider study corridor affecting around 750 affected landholders and during this stage we were informed of the need for improvements to our engagement plan. A review by independent Landholder and Community Advocate Rod Stowe in early 2021 identified several areas for improvement and one of which was the establishment of Community Consultative Groups (CCGs) across three regions which will provide opportunities for landholders, local community organisations, councils and members of the community to be more actively involved.

In September 2021 we announced changes to support the preference for a double-circuit configuration for the entire route. This will reduce the Project's footprint and minimise environmental impacts.

- **Stage 2 – Narrowed Study Corridor landholder and community engagement**

Stage 2 of our engagement conducted over June to December 2021, has involved further discussions with landholders and communities to examine ways to reduce the overall impact on them based on the revised route and corridor. During this Stage, we submitted the Scoping Report to the NSW Department of Planning and Environment as part of the environmental approval process. The scoping report also gives an early indication of community views on the project and identified what engagement will be carried out during the preparation of the EIS.

We have used this feedback to inform the development of our updated HES for Stage 3.

- **Stage 3 – Project development HES engagement initiatives, EIS consultations and exhibitions**

Stage 3 involves implementing engagement initiatives for land acquisitions, the environmental approval process and social legacy outcomes. A key aspect is the development and publication of the final EIS will be

followed by a public exhibition and stakeholder feedback sessions scheduled for Q3 2022 and completed by Q2 2023. Landholders, the public and other stakeholders will have the opportunity to comment through the EIS phase.

The key activities in stage 3 are:

- Landowner engagement: narrowed corridor action plan
- Community engagement: event and engagement action plan
- Indigenous engagement action plan
- EIS planning and exhibition plan
- Social legacy action plan
- Media action plan
- Environmental assessment requirement (SEARs) action plan

3.6.1. Resource requirements

The resource requirements for the community and stakeholder engagement work program consist of:

- The work already undertaken commensurate with actual costs to 31 December 2021.
 - This has included the preparation of the HES and early engagement with the community with a team consisting of a small internal team with our consultant Aurecon providing the bulk of the required specialist resources. Some media and community events have been held.
 - These activities corresponding to the actual costs represent around 33 per cent of this work program's total within the D&A phase, representing a measure of progress to date.
- The remaining work commensurate with the forecast additional capex
 - The forecast remaining work will focus engagement with directly affected stakeholders and communities within the narrower 200 metre corridor. Our internal team is relatively small and is involved in managing the media and communications and supporting the overall community strategy and activities. 67 per cent of the total resources are required to implement the remaining work. This will predominately be provided by specialist consultants.

Key parameters and drivers for the level of resources required for community and stakeholder engagement are:

- the nature of the land impacted by the transmission line route is sensitive and densely populated (and is comparable only to the eastern section of PEC). The land is predominately in natural landscape containing a diversity of habitats with high biodiversity value, the route travelling through forested areas, near National Parks and waterways
- our commitment to preserve recreational and heritage sites and indigenous culture
- the number of directly impacted landholders over the transmission line routes (362 landholders)
- population density in the local regions is high (i.e. compared to PEC)
- our commitment to establish a long-term social legacy with impacted communities
- responding to stakeholder feedback to improve our engagement including by establishing CCGs.

3.6.2. Community and stakeholder engagement milestones

Table 3.13 below provides the current plan of high-level milestone deliverables required from the engagement processes.

Table 3.13 Community and stakeholder engagement milestones

Milestone	Expected timing
Initial wider corridor landholder consultation - commenced	Apr 2020
Initial community engagement plan finalised, and engagement - commenced	Oct 2020
PACR publication submitted – public consultation begins	Jul 2021
PACR public consultation finalised	Oct 2021
200m corridor announcement and early engagement	Feb 2022
Pre-EIS scoping report announcement and commence engagement	Feb 2022
Revisions to the engagement strategy and plans (HES)	Apr 2022
200m corridor second phase announcement and commence engagement	Apr 2022
70 metre corridor announcement and early engagement	May 2022
EIS exhibition early engagement	Dec 2022
EIS submission - schedule constraint	Jan 2023
Final EIS exhibition announced, and engagements commence	Jan 2023
EIS public exhibition complete	Oct 2023
Contractor award announced, and engagements commence	Nov 2023
Stage 2 (Implementation) (subject to AER approval)	Jun 2024

3.7. Regulatory approvals and other support

HumeLink is the first project to progress through the two-stage CPA process with the AER. The Stage 1 Application includes early works activities and costs and our Stage 2 Application will include the project implementation costs.

3.7.1. Resource requirements

The resource requirements for regulatory approvals and other support consist of:

- the work already undertaken commensurate with historical costs. This has included the RIT-T assessment (PSCR, PADR and PACR). This includes planning and documentation for submissions, modelling of market benefits, related corporate and regulatory support, reviews and economic independent verification of the content and data. Historical costs represent around a half of this work program's total forecasted costs.

- the remaining work commensurate with the forecast additional capex. This involves explaining and justifying our forecast costs, document preparation, regulatory modelling, commissioning expert reports, and independent assessment and verification of our costs. It also involves continued engagement with the AER and AEMO.

3.7.2. Regulatory approval milestones

Table 3.14 below provides the current plan of future high-level milestone deliverables required as part of the staged RIT-T and CPA process.

Table 3.14 Regulatory target milestones

Milestone	Expected timing
PACR publication (complete)	Jul 2021
PACR public consultation (complete)	Oct 2021
RIT-T (complete)	Jan 2022
Feedback loop and confirmation of optimal development (complete)	Feb 2022
Stage 1 CPA Board approval and submission to the AER	Apr 2022
Stage 1 CPA Determination	Jun 2022
Feedback loop and confirmation of optimal development before Stage 2 CPA	Oct 2023
Stage 2 Board approval and submission to the AER	Dec 2023
Stage 2 CPA Determination	Jun 2024
Stage 2 FID	Jun 2024

Appendix A : Project Scope

We completed the Regulatory Investment Test for Transmission (RIT-T) in July 2021, which identifies HumeLink (Option 3C) as the preferred option for reinforcing the southern shared network.¹⁵

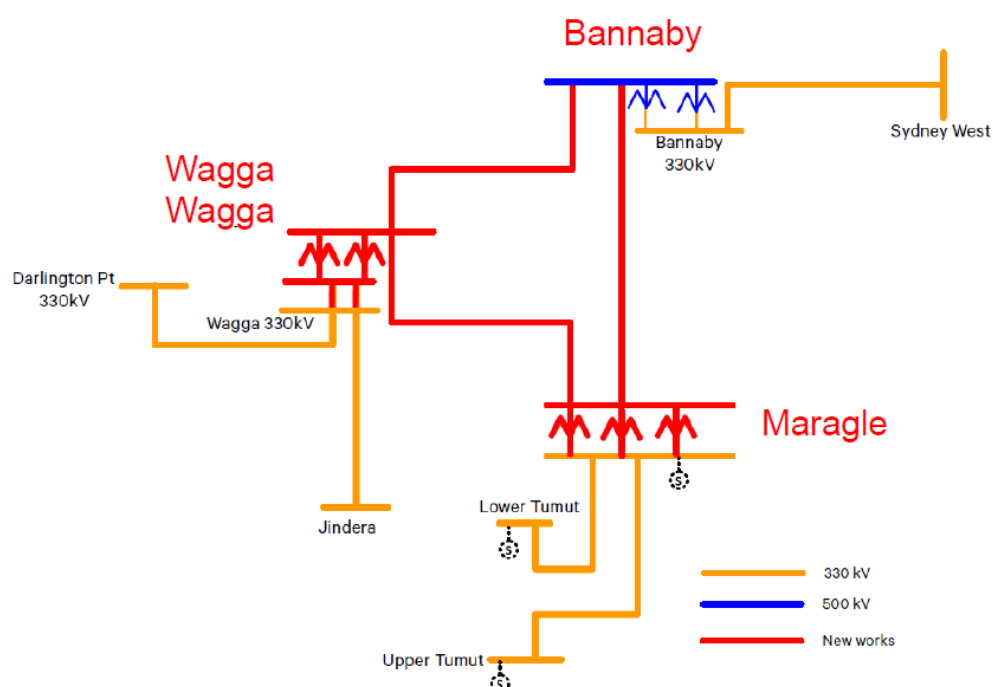
Option 3C requires the construction of new 500 kV transmission lines in a 'loop' between Maragle, Bannaby and Wagga Wagga. This transmission network development reinforces the NSW Southern Shared Network and unlocks access to new generation sources. This is shown in a single line diagram representation in Figure 3.6.

The Project is currently in the concept stage with further scope refinement to occur during the project development phase.

The scope for Option 3C includes the following:

- Three (3) new 500 kV double circuit transmission lines, connecting the existing Bannaby 500 kV Substation, new Maragle 500 kV (Snowy 2.0) Substation and new 500 kV Gugaa Substation, via a common intersection point located in the vicinity of Blowering Dam.
- In addition to the 500 kV lines above, there will be one (1) new 330 kV double circuit transmission line connecting the new 500 kV Gugaa Substation and the existing Wagga Wagga 330 kV Substation.

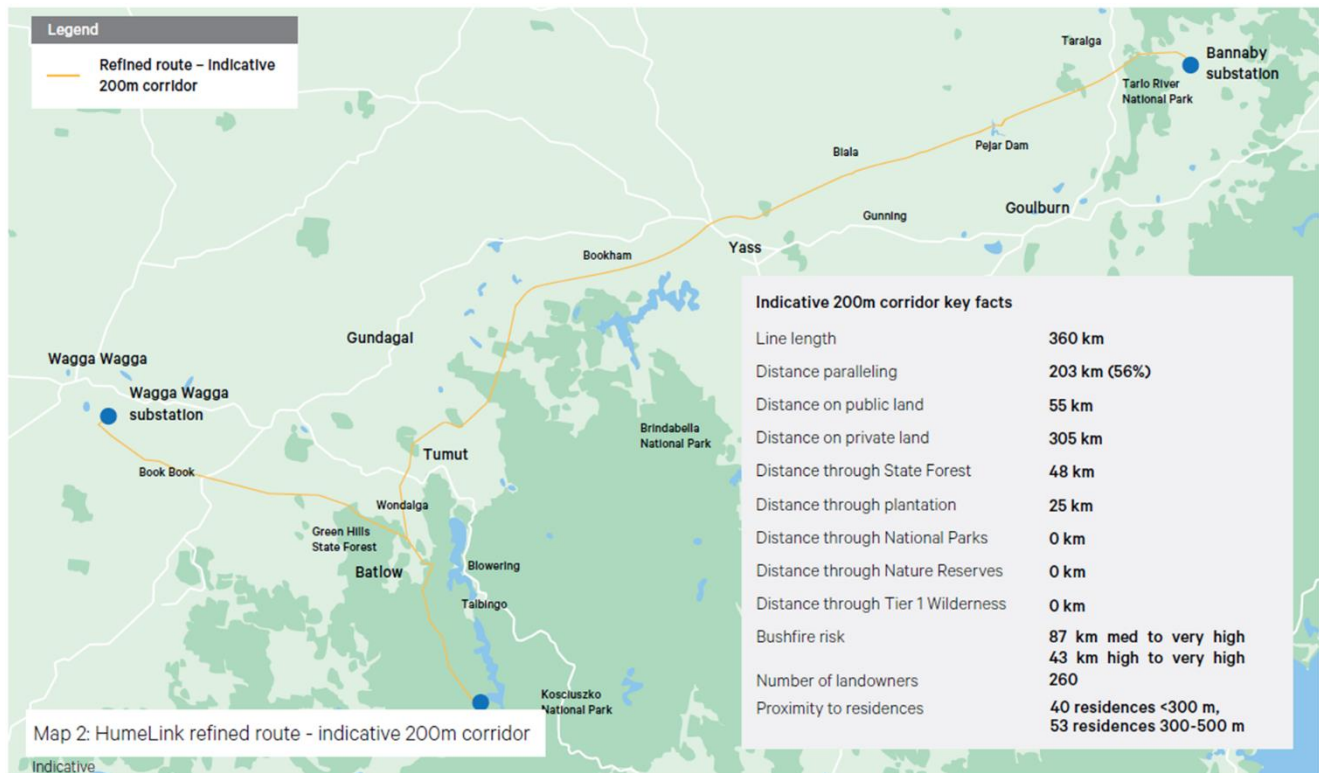
Figure 3.6 HumeLink Option 3C circuit diagram of network connections



¹⁵ Transgrid, [Reinforcing the NSW Southern Shared Network to increase transfer capacity to demand centers \(HumeLink\)](#) (HumeLink PACR), July 2021, p. 1

A map representing the proposed 500 kV and 330 kV double circuit transmission line routes is shown in Figure 3.7.

Figure 3.7 Map of proposed transmission line routes



The proposed transmission line arrangements are as follows:

- 500 kV double circuit transmission line from existing Bannaby 500 kV Substation to a location in the vicinity of Blowering Dam.
- 500 kV double circuit transmission line from Blowering Dam location to new Maragle 500 kV Substation.
- 500 kV double circuit transmission line from Blowering Dam location to new Gugaa 500 kV Substation.
- 330 kV double circuit transmission line from new Gugaa 500/330 kV Substation to existing Wagga 330 kV Substation.

The proposed Substations are:

- HumeLink will extend two existing substations at Bannaby and Wagga Wagga and establish new substations at Maragle and Gugaa. New equipment will include:
 - A new Maragle 500 kV substation including three new 500/330/33 kV 1500 MVA transformers¹⁶ and provision for the additional 500 kV double circuit transmission lines.

¹⁶ The Maragle 330 kV switching station is being constructed as part of the Snowy 2.0 Generator Connection project on the same site and will precede HumeLink works.

- A new Gugaa 500/330 kV Substation in the vicinity of Wagga Wagga Substation including two new 500/330/33 kV 1500 MVA transformers.
- Extension and augmentation of the existing Bannaby 500/330 kV Substation to accommodate two additional 500 kV double circuit transmission lines.
- Extension and augmentation of the existing Wagga 330 kV Substation to accommodate the additional 330 kV double circuit transmission lines.