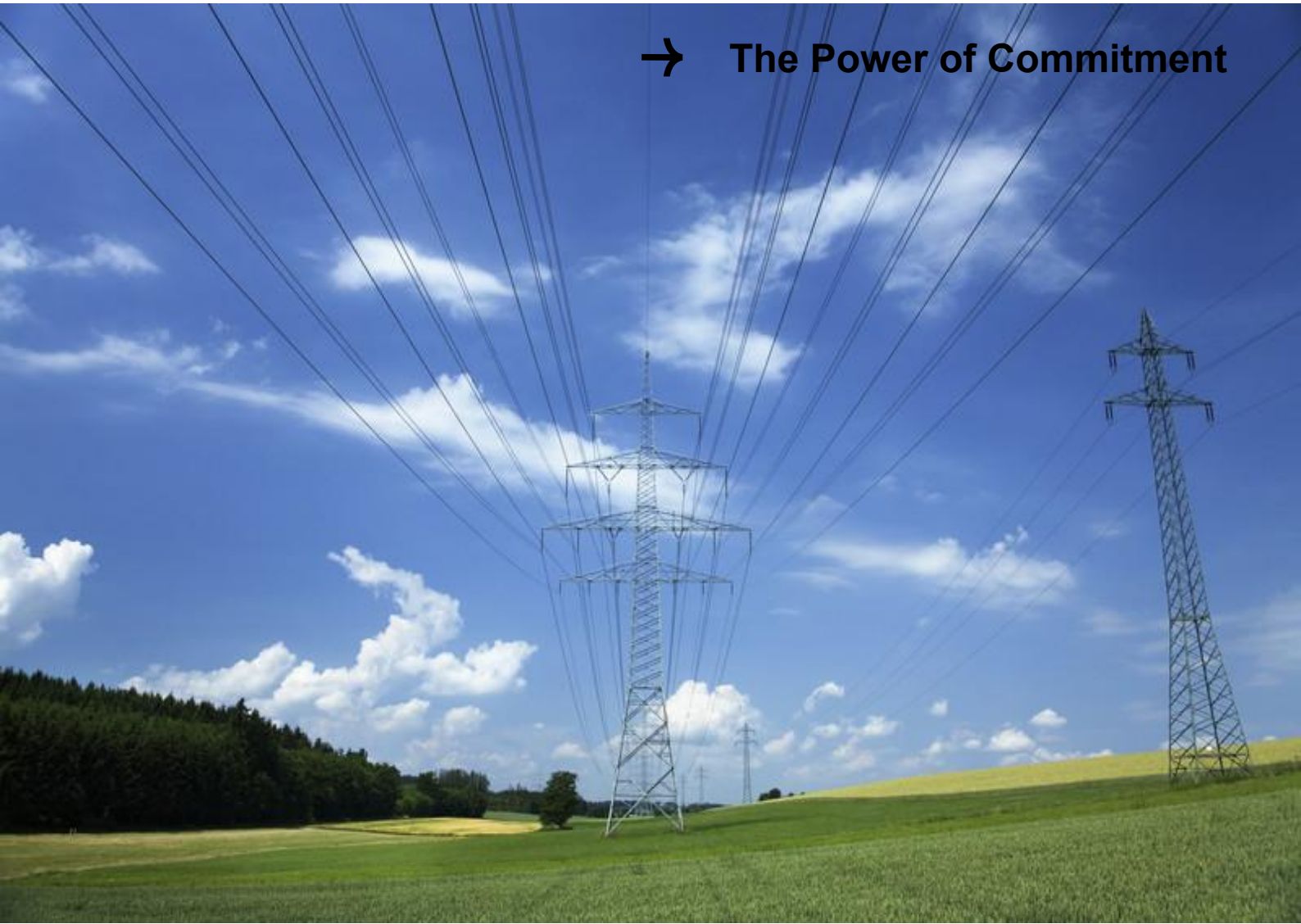
GHD Advisory

North West Transmission Developments

CPA-2 - Independent Verification and Assessment

Tasmanian Networks Pty Ltd

31 October 2025



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Executive summary

Marinus Link is a proposed 1500 MW High Voltage Direct Current (HVDC) interconnector, crossing Bass Strait and connecting the states of Tasmania and Victoria. The Australian Energy Market Operator's (AEMO's) Final 2024 Integrated System Plan (ISP)[1] reconfirms the actionable status of Project Marinus (consisting of Marinus Link project and North West Transmission Development (NWTD) project) without decision rules. The 2024 ISP also details that the interconnector will be delivered as two 750MW cables with Stage 1 to be delivered by June 2030 and Stage 2 by June 2032[2] to align with AEMO's Optimum Development Path (ODP).

Across the Regulatory Investment Test for Transmission (RIT-T) phases prepared by TasNetworks up to and including the Project Specification Consultation Report (PSCR) published in July 2018, the NWTD was included as a component of the wider Marinus Link project. The NWTD is the onshore Alternating Current (AC) augmentation required to TasNetworks transmission network to facilitate the connection of Marinus Link project into Tasmania and will include new dual circuit 220kV transmission lines with decommissioning and demolition of existing 220kV single circuit lines, augmentation of Burnie, Sheffield and Palmerston substations, and construction of the Heybridge Switching Station.

TasNetworks is developing and will deliver the NWTD project (onshore AC augmentation), whereas a separate entity called Marinus Link Pty Ltd (MLPL) is developing and will deliver the Marinus Link project (HVDC interconnector).

To align with the proposed HVDC interconnector work phase, the NWTD project will be undertaken in two separate stages:

- Stage 1[3] – HVDC Cable 1 and the associated NWTD works, being upgrades to the Palmerston–Sheffield and Sheffield–Burnie 220 kV transmission lines, and construction of the Heybridge Spur East 220 kV transmission line, referred to as the 'coastal' route
- Stage 2 – HVDC Cable 2 and the associated NWTD works, being construction of the Staverton–Hampshire Hills and Burnie–Hampshire Hills 220 kV transmission lines, and upgrade of the Sheffield–Staverton 220 kV transmission line, referred to as the 'inland' route.

In October 2024, TasNetworks submitted an early works Contingent Project Application (CPA) "CPA-1" to the Australian Energy Regulator (AER). This covered NWTD early works and activities to progress through to the Final Investment Decision (FID) forecasted at $167.3M ($Real 2023-24) (net capex of $151.9M after application of $15.4M of Australian Government grant funding).

In March 2025, the AER released its determination approving the $151.9M noting that the Capital Expenditure Sharing Scheme (CESS) would be assessed in TasNetworks' subsequent CPA-2 submission.

TasNetworks intends to submit a CPA-2 to the AER in October 2025, covering the remaining costs to deliver the NWTD project. To support this submission, GHD has been engaged by TasNetworks to conduct an independent

[1] AEMO, Final 2024 Integrated system Plan (2024 ISP), June 2024 p.14
[2] AEMO, Final 2024 Integrated system Plan (2024 ISP), June 2024 p.62
[3] AEMO, Final 2024 Integrated system Plan (2024 ISP), June 2024 p.63

verification and assessment of their CPA-2 to support their submission to the AER. The assessment considers whether the costs and forecasts included in CPA-2 are prudent and efficient and are required to achieve project timeframes, reduce the final projects costs, and / or reduce schedule and cost risks.

In summary, a high proportion (92%) of the direct cost estimate is supported by a modified Engineering, Procurement and Construction (EPC) agreement that represents the outcome of direct negotiations with Genus [redacted] The negotiations were support by [redacted] analysis of the estimate and pricing assumptions, development of risk provisions checked by [redacted] through the provision of Quantitative Risk Analysis (QRA) using Monte Carlo analysis.

The structure of the EPC contract is open book with defined risk provisions, potentially reducing excessive risk provisioning. The agreement includes a Guaranteed Maximum Price (GMP) with benefit sharing mechanisms to incentivise efficient delivery.

Benchmarking at the Transmission Line (TL) cost per kilometre level indicates alignment with reference projects, noting that 220kV references are limited. GHD has not utilised the AEMO's Transmission Cost Database (TCD) tool in this assessment, as benchmarking sources for 220kV network infrastructure predominantly references the NWTD itself, limiting the tool's comparative value.

Reliance has been placed upon the tender process and subsequent negotiations to support substation costs as GHD has not been able to identify suitable benchmarking references, including the TCD for the same reasons as detailed above.

Risk provisions are based upon a P50 capex estimate for contingent and inherent schedule risks associated with the delivery of Stage 1 of the NWTD. Risks not covered by the EPC agreement or potentially more than EPC pricing assumptions allow are included in the total capital forecast. Again, this is based upon QRA Monte Carlo analysis with benchmarking of provisions as a percentage to the total forecast indicating alignment with other reference projects being delivered over difficult terrain, with some reservation that the provision is potentially conservative.

With the addition of the risk provisioning and the work undertaken in finalising the EPC contract GHD considers that the capex forecast represents a blend of Class 2/3 estimates representing the best available estimate at this stage of the project's development. The forecast is considered prudent, efficient and reasonable for carrying out the NWTD project.

TasNetworks CPA-2 seeks $977.6M ($Real 2023-24) in funding for Stage 1, with further detail provided in Section 5 of this report. GHD's assessment findings are outlined in Table 1.

Table 1 GHD's independent verification and assessment conclusions

Category	Commentary	$M
Direct construction costs	92% of the direct construction costs forecast is supported by the EPC agreement and contract variations. These were concluded based upon negotiations between TasNetworks and Genus. The EPC agreement structure is based upon a cost-plus margin and administrative fee arrangement with a GMP and capped risk allowance, both subject to a gain sharing agreement which is considered an effective mechanism to drive positive project management delivery.	632.4

Category	Commentary	$M
	Benchmarking of TL costs indicate alignment with reference projects, noting that 220kV references are limited. Reliance has been placed upon the tender process and subsequent negotiations to support substation costs as GHD has not been able to identify suitable benchmarking references. The remaining forecast elements are either based upon third party advice or detailed estimation. The total direct construction forecast is supported by the EPC agreement third party advice or detailed estimation. The activities are required to deliver the project, with efficiency demonstration supported by [redacted] analysis of the forecast and underlying assumptions, negotiations and the structure of the contract.	
Project risks	Overall, GHD's assessment of the NWTD Stage 1 risk and contingency allowance found that: – The NWTD Stage 1 risk register captures a broad spectrum of risks (technical, environmental, property, stakeholder, commercial), each with defined causes, consequences, and owners. The major risk categories typical of a large transmission project have been examined by GHD. Each risk's residual likelihood and impact range were assessed by NWTD (or external) subject-matter experts, forming the foundation of the quantitative analysis. – TasNetworks conducted a Monte Carlo simulation using @Risk (or similar tool), modelling ~80+ discrete risk events with three-point cost and schedule estimates. The QRA produced a probabilistic distribution of total project risk cost, from which the P50 and P80 values were derived. – The risk analysis separates owner-retained risks from contractor risks, which confirms that contingent and inherent risks on the owner's side are captured without material overlap. – The $131.5M P50 contingency corresponds to roughly 13% of the Stage 1 base capex (excl. early works). This was benchmarked against comparable projects and found to be reasonable. Risk provisioning is considered prudent, with the total risk provision comparable to benchmark references.	131.5
Land and property	Land and property costs relate to landholder compensation and compulsory acquisition costs for transmission line easements. The capex forecast is supported by external estimates from Jones Lang LaSalle (JLL) and other third parties. Reliance has been placed upon the experience of JLL who has based their estimate upon reasonable assumptions.	78.9
Labour and indirect costs	Labour and indirect costs represent the incremental costs required to undertake the project development, contract administration, management of construction and delivery works of Stage 1 of the NWTD. The costs include: – Incremental labour roles from September 2025 to February 2026 that were not included in the Early Works CPA-1 – Forecast labour and indirect costs from March 2026 to June 2030. The forecasted labour costs have been estimated based on: – The Full Time Equivalents (FTE) profile and number of roles required to deliver each project objective to support delivery – The month-by-month FTE requirements for each role type to meet the project schedule, with the composition of teams considered appropriate to deliver project stream objectives. Other indirect costs included are supported by third party quotes / estimates or allowances for a Community Benefits Sharing Program (CSBP) at 1% of total forecast cost. Based upon other projects of comparable size this allowance is within 20% of benchmarks.	128.1
Equity raising costs	Outside GHD's scope.	6.7
Total		**977.6**

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.2 and the assumptions and qualifications contained throughout the Report.

Glossary

AACE	Association for the Advancement of Cost Engineering
AC	Alternating Current
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
BAU	Business As Usual
CBSP	Community Benefits Sharing Program
CESS	Capital Expenditure Sharing Scheme
CPA	Contingent Project Application
EBA	Enterprise Bargaining Agreement
ECI	Early Contractor Involvement
EOI	Expression of Interest
EPC	Engineering, Procurement and Construction
FID	Final Investment Decision
FTE	Full Time Equivalent
GIS	Gas Insulated Switchgear
GMP	Guaranteed Maximum Price
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
ISC	Infrastructure Sustainability Council
ISP	Integrated System Plan
LLE	Long Lead-time Equipment
LLI	Long Leadtime Items
LNTP	Limited Notice to Proceed
JLL	Jones Lang LaSalle
NEM	National Energy Market
MLPL	Marinus Link Pty Ltd
NWTD	North West Transmission Development
MW	Megawatt
NPV	Net Present Value
ODP	Optimum Development Path
OGMP	Original Guaranteed Maximum Price
OHTL	Overhead Transmission Line
PACR	Project Assessment Conclusions Report
PADR	Project Assessment Draft Report
PMO	Project Management Office
PMP	Property Management Plan
PSCR	Project Specification Consultation Report
QRA	Quantitative Risk Analysis

RIT-T	Regulatory Investment Test for Transmission
RFP	Request for Proposal
ROI	Registration of Interest
TCD	Transmission Cost Database
TL	Transmission Line
TNSP	Transmission Network Service Providers

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1. Introduction

The NWTD will include approximately 240 km of new and upgraded transmission lines, along with associated infrastructure designed to increase the capacity of Tasmania's electricity network and enable connection to the Marinus Link HVDC interconnector.

Delivery of the NWTD will occur in two stages, aligned with the AEMO ODP:

– Stage 1 is scheduled for completion by June 2030

– Stage 2 is scheduled for completion by June 2032 (as confirmed in the 2024 ISP)

The 2024 ISP identified Project Marinus as a single actionable ISP project without decision rules. Project Marinus includes:

– Marinus Link project: the HVDC interconnector between Tasmania and Victoria, to be delivered by MLPL

– The associated HVAC on shore NWTD project, to be delivered by TasNetworks.

Throughout 2025, several key milestones were achieved that signalled progression of the Marinus Link project:

– March 2025: the AER published an Issues Paper in response to the Marinus Link Revenue Proposal – Part B (Construction costs), for public consultation

– May 2025: the AER published their initial draft decision on Marinus Link Stage 1, Part B (Construction costs Transmission Determination 2025-30, accepting market-tested costs for converter systems and HVDC cables

– May 2025: the Victorian Minister for Planning concluded that the project could proceed with acceptable environmental effects, subject to adoption of recommended refinements to environmental management

– May 2025: the MLPL Board recommended its shareholders proceed with an FID for Stage 1 of the project

– August 2025: shareholder made the FID, and Commonwealth environmental approval for Marinus Link was achieved.

In anticipation of Marinus Link project approval, TasNetworks submitted CPA-1 to the AER in October 2024, covering early works for the NWTD and activities to progress to FID. The application forecasted a total cost of $167.3M ($Real 2023-24) (net capex of $151.9M). In March 2025, the AER released its determination approving the $151.9M, noting that assessment under CESS would be assessed in TasNetworks' CPA-2 submission.

1.1 Purpose of this report

The purpose of this report is to provide an independent verification and assessment of the capital forecast to be included in TasNetworks NWTD CPA-2, which has been prepared for TasNetworks to support their submission to the AER.

1.2 Scope and limitations

TasNetworks has requested an independent verification and assessment of the NWTD CPA-2.

The NWTD independent verification and assessment:

– Follows an independent verification and assessment of CPA-1

– Provides independent assessment of the capital forecast included in CPA-2
– Assesses the basis of preparation used in forecasting detailed in TasNetworks' Capex Forecasting Methodology and other documentation used to support forecasting accuracy
– Assesses whether the costs and forecasts included in CPA-2 are prudent and efficient and are required to achieve project timeframes, reduce the final projects costs, and / or reduce schedule and cost risks.

2. Background

The following section provides an overview of the development of the Project Marinus.

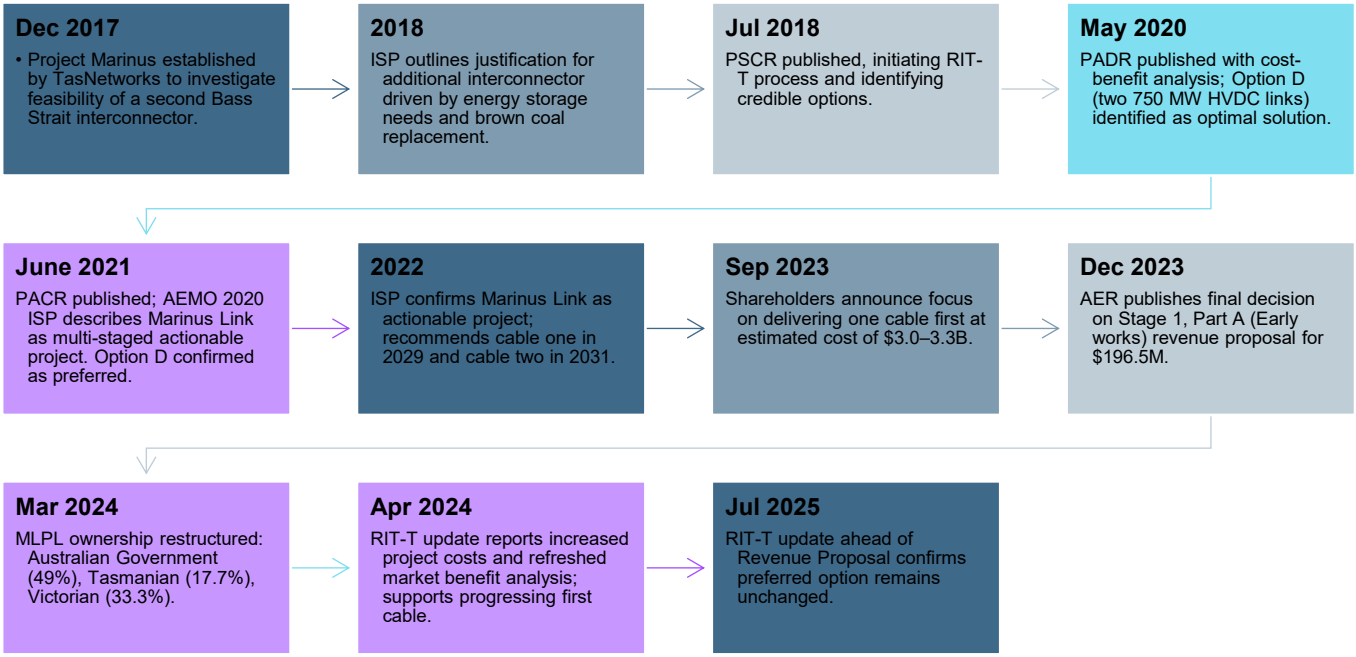

Figure 1 Marinus Link project timeline

Project Marinus was established by TasNetworks in December 2017. With funding support from the Australian Government via the Australian Renewable Energy Agency and the Tasmanian Government, Project Marinus was asked to undertake a detailed feasibility and business case assessment of a second Bass Strait electricity interconnector, known as Marinus Link.

The 2018 ISP details the justification required for an additional Bass Strait interconnector as follows:

"The economic justification behind an additional Bass Strait interconnector is expected to be driven primarily by the long-term need for energy storage across the NEM, and the projected replacement of energy produced by brown coal-fired generation in Victoria. Additional benefits would include accessing high-quality wind resources in Tasmania and improving hydro efficiencies by repurposing and refurbishing existing assets[4]".

TasNetworks published the PSCR in July 2018 which is the first step in the RIT-T process. This document describes the "identified need" and identifies several creditable options that would maximise "the present value of net economic benefit to all those who produce, consume and transport electricity in the market."[5] This RIT-T document considered the following options:

[4] AEMO 2018 ISP P 88
[5] National Electricity Rules, clause 5.16.1(b)

– Option 1: A 600 MW monopole HVDC link across the Bass Strait, including associated HVAC transmission network augmentation on shore, now referred to as the NWTD and connection assets
– Option 2: A 1,200 MW bipolar HVDC link across the Bass Strait, including associated HVAC transmission network augmentation on shore, now referred to as the NWTD and connection assets.

Subsequently, TasNetworks published the Project Assessment Draft Report (PADR) in May 2020. This report considered a cost-benefit analysis that examines whether and when the project should proceed with market modelling performed by Ernst & Young. This analysis indicated the following as the optimal solution:

– Stage 1: An initial 750 MW HVDC link between Burnie in Tasmania and Hazelwood in Victoria with supporting network augmentations in Tasmania, now referred to as the NWTD, should be commissioned in 2028
– Stage 2: The commissioning of a further 750 MW HVDC link in 2032.

The PADR confirms that the investment need remains unchanged. However, it introduced additional credible options based on subsequent work, which noted that 750 MW capacity increments are also feasible and offer higher power transfer capacity at a relatively small incremental cost.

The Project Assessment Conclusion Report (PACR) was published in June 2021. At this point, the AEMO's 2020 ISP described the Marinus Link project as "a multi-staged actionable ISP project to be completed from 2028-29, with early works recommended to start as soon as possible, and with further stages to proceed if their respective decision rules are satisfied."[6] This document recommended Option D as the preferred option which is a 1500 MW HVDC interconnector, comprising two 750 MW symmetrical monopole HVDC interconnectors, plus associated AC network upgrades, now referred to as the NWTD. With earliest commissioning dates of 2027 for the first 750 MW stage and 2029 for the second 750 MW stage.

The following key risks to project deliverability were identified throughout this period:

– Customer pricing impacts
– Funding arrangements
– Ownership structure

To address these risks, the ownership of MLPL was restructured in March 2024. MLPL is now jointly owned by the Australian Government (49%), Tasmanian (17.7%) and Victorian governments (33.3%). Under this structure, MLPL would progress the HVDC link and TasNetworks is responsible for delivering the NWTD.

The 2022 ISP confirmed Marinus Link as an "actionable project under the optimum development path. The ISP recommends commencing operation of cable one in 2029 and cable two in 2031. On 3 September 2023, Marinus Link shareholders announced the project will focus on delivering one cable in the first instance at an estimated cost of $3.0-3.3B, with negotiations to continue on a second cable.

In December 2023 the AER published its final decision in relation to Marinus Link's Stage 1, Part A (Early works) revenue proposal for $196.5M (Real 2022-23).

The following Regulatory Investment Test for Transmission (RIT-T updates) where published:

[6] AEMO, 2020 Integrated System Plan, July 2020, page 82

– April 2024 – this update communicated likely increases to the project's cost and published the results of refreshed market benefit analysis. The conclusions drawn indicate progression with the first cable as soon as possible with the timing of the second cable under review.
– July 2025 – a further update in advance of submitting a Revenue Proposal reflecting updates to market benefits. Marinus Link in this update concludes that the updated market modelling, combined with the latest project cost information confirms that the preferred option remains unchanged from the PACR and the RIT-T update in April 2024.

3. Assessment

3.1 Methodology

GHD Advisory has applied several approaches to assess the reasonableness of costs included in CPA-2 and supported by TasNetworks' Capex Forecasting Methodology and to determine whether the expenditure is both prudent and efficient.

In considering the capex forecast, GHD relied upon a bottom-up assessment of forecast elements to determine the extent to which it is supported by appropriate evidence.

The bottom-up approach considered the reliability of evidence used to support forecast elements and the approach applied depended on the nature of the cost element and included a combination of:

	Evidence-based review, relying upon TasNetworks': – Competitive tendering outcomes and contract negotiations – Supporting contracts and purchase orders and variations – Third party reports covering more complex estimates. In these cases, GHD considered the reasonableness of the underpinning assumptions used and whether the forecast was based upon the best available information.
	Recalculation and validation against supporting evidence supplied by third parties. Including: – Verification of actual and forecasted costs through selective review of supporting documentation to confirm: • Amounts • Timeframes and scope • Relevance to NWTD – Recalculation of estimates and validation of assumptions, including: • Regulatory charges where relevant • Cost estimates provided by third parties • Cost estimates which can be verified through benchmarking – Benchmarking where appropriates benchmarking references were available.
	Internal labour costs: assessment of prudency and efficiency based on team structure, stream objectives, scheduled hours, number of FTE roles, and applied position rates.
	Comparison of TasNetworks' cost forecasts against scope definitions and assumptions outlined in the Capex Forecasting Methodology.

Across this bottom-up approach, GHD has considered whether the:

– Costs are prudent and would be incurred by other reasonable Transmission Network Service Providers (TNSPs)

– Costs relate to activities required to achieve project timeframes, reduce the final projects costs, and / or reduce schedule and cost risks to assess prudency and efficiency.

3.2 Materiality

GHD defines individual cost elements under $1M (representing 0.1% of total capital forecast) as immaterial. For costs that are supported by a large number of cost items, GHD may select the most material items for review. Where this approach has been applied, it is noted in the body of the report.

4. Scope definition

The following subsections outline the proposed scope of the NWTD project and the early works activities required to support delivery. The scope is divided into two stages reflecting staged delivery of the two Marinus Link cables. The CPA-2 focuses upon the Stage 1 scope.

4.1 Overall NWTD scope

Based upon the TasNetworks Contingent Project Application – Construction – A1 Principal Application and the 2024 ISP, the NWTD will be undertaken in two separate stages to support Cable 1 and Cable 2. This will require delivery in two stages:

- Stage 1 – HVDC Cable 1 and the associated NWTD onshore works, being upgrades to the Palmerston–Sheffield and Sheffield–Burnie 220 kV transmission lines, and construction of the Heybridge Spur East 220 kV transmission line, referred to as the 'coastal' route
- Stage 2 – HVDC Cable 2 and the associated NWTD onshore works, being construction of the Staverton–Hampshire Hills and Burnie–Hampshire Hills 220 kV transmission lines, and upgrade of the Sheffield–Staverton 220 kV transmission line, referred to as the 'inland' route.

The 2024 ISP confirms that the timing of Stage 1 is by June 2030 and the timing of Stage 2 by June 2032.

The two stages are detailed in the figure below.

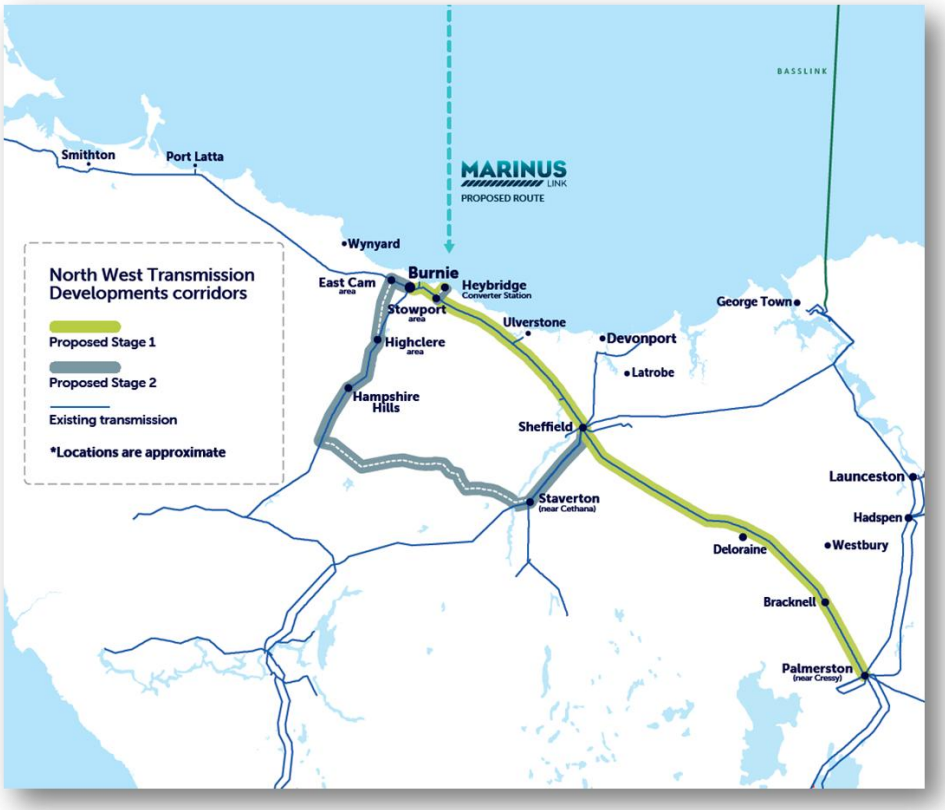

Figure 2 NWTD Stage 1 (Cable 1) and Stage 2 (Cable 2)

4.2 Stage 1 NWTD scope

The following table details only the Stage 1 scope but provides an overview of the Stage 2 scope which will be the subject of a future CPA submission.

Table 2 Stage 1 scope details

Impacted site	Stage 1 scope details	Site status	NWTD Stage 1	NWTD Stage 2
Palmerston–Sheffield 220 kV Transmission Line (TL)	– Construction of 80km of new double-circuit 220 kV transmission line, including 179 new steel transmission towers – Decommissioning and removal of 261 old transmission towers and associated hardware – Overall reduction in average easement width from 80 m to 50 m.	Existing	✓	-
Sheffield–Burnie 220 kV TL	– Construction of 47 km of new double-circuit 220 kV transmission line, including 82 new steel transmission towers and 25 dual-monopole structures – Decommissioning and removal of 138 old transmission towers and associated hardware – Widening of the existing easement at various locations, typically comprising an easement increase of 20 m.	Existing	✓	✓
Sheffield–Burnie 110 kV TL	– Realignment of 4 km of 110 kV transmission line, including construction of 14 new steel transmission poles * – Decommissioning and removal of 14 old transmission towers and associated hardware.	Existing	✓	-
Heybridge Spur East 220 kV TL	– New easement secured with 60 m width * – HB Spur East - construction of 3 km of new double-circuit 220 kV transmission line, including nine (9) new steel transmission towers – Construction of HB Spur East will facilitate the connection of Heybridge Switching Station (and therefore Marinus Link) to Sheffield–Burnie 220 kV transmission line and the broader north-west 220 kV transmission network via two 3-ended circuits: o Sheffield–Heybridge–Burnie No. 1 220 kV transmission circuit o Sheffield–Heybridge–Burnie No. 2 220 kV transmission circuit.	New	✓	✓
Heybridge Spur West 220 kV TL	Stage 2 scope	New	-	✓
Sheffield–Farrell 220 kV TL	Stage 2 scope	Existing	-	✓
Sheffield–Wilmot 220 kV TL	Stage 2 scope	Existing	-	✓

Impacted site	Stage 1 scope details	Site status	NWTD Stage 1	NWTD Stage 2
Sheffield–Cethana 220 kV TL	Stage 2 scope	Existing	-	✓
Sheffield–Lemonthyme 220 kV TL	Stage 2 scope	Existing	-	✓
Sheffield–Fisher 220 kV TL	Stage 2 scope	Existing	-	✓
Staverton–Hampshire Hills 220 kV TL	Stage 2 scope	New	-	✓
Burnie–Hampshire Hills 220 kV TL	Stage 2 scope	New	-	✓
Heybridge Switching Station	– Installation of nine (9) 220 kV Gas Insulated Switchgear (GIS) circuit breakers in a breaker and half configuration – Single point of connection to the Marinus Link Converter Station via Converter Station #1 220kV transmission circuit with double breaker connectivity by utilising Stage 2 future bays – Double-circuit connection to the transmission network via HB Spur East 220 kV transmission line.	New	✓	✓
Palmerston Substation	– Installation of six (6) live-tank 220 kV circuit breakers in a breaker-and-a-half configuration – Duplicate busbar protection installations including integration into all existing 220 kV bays.	Existing	✓	-
Sheffield Substation	– Extension of 220 kV buses A, B and E – Sectionalisation of the 220 kV Busbars – Installation of 14 live-tank 220 kV circuit breakers in a double-breaker configuration – Duplicate busbar protection installations including integration into all existing 220kV bays – Bay relocations for Sheffield–Wilmot, Sheffield–Cethana and Sheffield–Lemonthyme 220 kV transmission lines.	Existing	✓	✓
Burnie Substation	– Extension of 220 kV buses A and B – Installation of four (4) live-tank 220 kV circuit breakers in a double-breaker configuration – Installation of one (1) live-tank 220 kV circuit breaker and one (1) live-tank 110 kV circuit breaker to facilitate commissioning of pre-existing T3 220/110 kV network transformer – Duplicate busbar protection installations including integration into all existing 220kV bays.	Existing	✓	✓

Impacted site	Stage 1 scope details	Site status	NWTD Stage 1	NWTD Stage 2
Staverton Switching Station	Stage 2 scope	New	-	✓
Hampshire Hills Switching Station	Stage 2 scope	New	-	✓

* TasNetwork was questioned over environmental biodiversity costs, with TasNetworks confirming that no provision is required.

Source - TasNetworks Contingent Project Application – Construction – A1 Principal Application

4.3 Procurement

4.3.1 Procurement process

An overview of the procurement process is provided in Section 3 of TasNetworks Direct Capex Forecasting Methodology.

TasNetworks' procurement process was structured into four phases:

– Phase 1: market sounding activities

– Phase 2: initial Request for Proposal (initial RFP)

– Phase 3: revised Request for Proposal (revised RFP)

– Phase 4: evaluation, negotiation and execution

Table 3 Overview of procurement process phases

Phase	Description	Timing
Phase 1: market sounding activities	TasNetworks NWTD Stage 1 Early Works Capex Forecast Method details that [redacted] was appointed to lead the market sounding process in conjunction with TasNetworks. This included a Registration of Interest (ROI) period followed by Expressions of Interest (EOI), during which over 30 entities expressed interest, later narrowed to five EOI submissions and ultimately three shortlisted tenderers.	July 2022 to March 2023
Phase 2: initial RFP	In June 2023, TasNetworks issued its initial RFP to these three entities; however, one withdrew early, leaving two participants.	June – November 2023
Phase 3: revised RFP	Following a government decision to stage the project, TasNetworks issued a revised RFP in March 2024 focused on Stage 1 scope and requiring open book pricing, including native cost files. [redacted]	March – May 2024
Phase 4: evaluation, negotiation and execution	To maintain competitive tension and ensure value for money, TasNetworks implemented a facilitated negotiation process [redacted] supported by the approval of a revised NWTD Negotiation Plan in July 2024. During this phase, TasNetworks engaged [redacted] a specialist consultancy for construction and infrastructure development projects, to conduct a Cost Validation Report as the independent owner's estimator and concurrently develop an independent estimate of the delivery cost to help verify and validate the AACE class 2 cost estimate determined through the Early Contractor Involvement (ECI) process. [redacted] found that the lump sum price for the ECI phase and GMP for the construction phase were both considered reasonable and compared favourably with the [redacted] independent estimate and industry benchmarking. [redacted] Upon determining the preferred contractor, TasNetworks entered contract negotiations with Genus. Contract negotiations commenced in late 2024 and concluded on 23 December 2024 when Genus was formally engaged as contractor to lead the engineering, procurement and construction of the Project.	May – December 2024

[redacted]

GHD concludes that the outcomes from competitive tender processes provides support for demonstrating efficiency. In this case TasNetworks has adopted a modified EPC contract with an ECI phase for the construction and delivery phase of the project with the following features to help achieve the same aims. The EPC contract:

– Allows TasNetworks to request and review the procurement process and documentation for the procurement of any goods or services procured by the Genus or any of its subcontractors.
– Pricing is open book with a gain share mechanism based on the difference between the final agreed Guaranteed GMP and actual costs, capped at a percentage of the total margin.
– Original GMP (OGMP) which comprises three components:
    - Fixed minimum construction price
    - Margin
    - Maximum risk price

During the ECI phase the OGMP cannot be adjusted. Subsequent adjustments in the construction and delivery phase can include:

– A positive or negative variation order issued by TasNetworks, such as:
    - A scope change
    - Costs associated with a latent condition
    - Costs associated with special contamination
– A reduction in the value of provisional sum work
– A Limited Notice to Proceed (LNTP) activity change
– Foreign exchange rate movement associated with materials and equipment procured in foreign currencies
– Commodity price movement relating to copper, aluminium and steel.
– Includes a gain-share mechanism - At the conclusion of the defect's liability period, if the total of actual costs and margin is less than the GMP (at construction phase commencement), the resulting cost saving will be shared between TasNetworks and Genus at a [redacted] ratio, respectively.

As detailed in TasNetworks Direct Capex Forecasting Methodology, they intend to use audit rights support TasNetworks' obligation to validate any payment claims on an open book basis and ensure costs proposed for inclusion are prudent and efficient.

From GHD's perspective, the [redacted] initial review of the Genus and the other tendered bid received in the initial RTP phase, helped in establishing a base for the following contract negotiations with Genus and potentially reduced the risk of disputes over assumptions into the future.

The open book nature of the contract with the GMP and agreed risk cap reduces the need for excessive contactor risk provisioning with the incentive scheme providing incentive for good project management practices.

5. Capital forecast

The Stage 1 capital forecast summarised in the table below includes:

– Direct capex – Works undertaken by the contractor to construct a new switching station at Heybridge, construct the new Heybridge Spur East TL and upgrade the other relevant TLs and substations, project risk costs and costs directly associated with the acquisition of land and easements.

– Labour costs – Owners labour and labour related costs associated with resources that will provide project services and will work with and manage the contractor to ensure successful delivery of the project.

– Indirect costs – Standard project related indirect costs (i.e. vehicles, travel and accommodation, and overheads) and services from specialist service providers that are required to ensure successful delivery of the Project.

The table below sets out the forecast costs for the Stage 1 construction and delivery for the period 1 March 2026 to 30 June 2030.

Table 4 Capital forecast ($M real 2023-24)

Capital element	Report reference	Total $M
Direct construction (direct capex)	Section 6	632.4
Project risks (direct capex)	Section 7	131.5
Land and property (direct capex)	Section 8	78.9
Labour and indirect costs	Section 9	128.1
Equity raising costs – Outside GHD's scope	-	6.7
Total		**977.6**

6. Direct construction forecast

The following table provides a summary of the direct construction forecast. These costs reflect the result of negotiations captured within the EPC agreement, subsequent variations to the agreement and other construction costs.

Table 5 Direct construction forecast ($M real 2023-24)

Capital element	Report reference	Total $M
Transmission lines	Sections 6.1 & 6.2	[redacted]
Substations	Sections 6.1 & 6.4	[redacted]
Contractor indirect costs	Section 6.1	[redacted]
Contractor margin fee		[redacted]
Contractor risk and contingency		[redacted]
Contractor provisional sum		[redacted]
Sub-total (EPC agreement)		[redacted]
Transmission lines - variations	Section 6.3	[redacted]
Substations - variations	Section 6.5	[redacted]
Other construction costs	Section 6.7.6	[redacted]
Total		**632.4**

6.1 EPC agreement direct construction costs

The following table reconciles the EPC agreement costs of [redacted] ($ Real 2023-24) to the amount included in the capex forecast.

Reconciliation of the EPC Costs [redacted] (Real 2023-24) requires:

- Indexation of the Real 2023-24 costs back to nominal values
- Agree the alignment of the nominal values back to the EPC agreement excluding costs claimed in CPA-1 (Refer Table 7).

The following tables show the indexing from nominal values to Real 2023-24 using the CPI index.

Table 6 EPC contract costs (including risk and contingency)

Project element	Nominal $M	Real June 2025 $M	Real June 2024 $M
Transmission Lines	[redacted]	[redacted]	[redacted]
Substations	[redacted]	[redacted]	[redacted]
Contractor Indirect Costs	[redacted]	[redacted]	[redacted]

Project element	Nominal $M	Real June 2025 $M	Real June 2024 $M
Contractor Margin Fee	[redacted]	[redacted]	[redacted]
Contractor Risk and Contingency	[redacted]	[redacted]	[redacted]
Contractor Provisional Sum	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted] **As per above table sub total**

The following table details GHD's build-up of the costs included in the EPC agreement against what TasNetworks has included in their estimate at Nominal [redacted]

Table 7 EPC agreement costs buildup ($Nominal)

Annexure 17 – EPC agreement	Additional notes	Nominal $M
Fixed minimum construction price	[redacted]	[redacted]
Less Stage 2 design fee included in the above	Stage 2 will be the subject of a future CPA	[redacted]
Less Long Leadtime Items (LLI) included in CPA-1	$39.1 ($Real 2023-24)	[redacted]
Less ECI costs included in CPA-1	$40.0 ($Real 2023-24)	[redacted]
Total Margin	[redacted]	[redacted]
Less margin on Stage 2 design fee included in the Total Margin above	Stage 2 will be the subject of a future CPA	[redacted]
Less margin ECI included in the Total Margin above	Included in CPA-1	[redacted]
Less margin on LLI included in the Total Margin above	Included in CPA-1	[redacted]
Risk continency	[redacted]	[redacted]
Provisional Sum Allowance	[redacted]	[redacted]
Sub total		[redacted]
TasNetworks forecast basis		[redacted]
Difference		**-**

6.2 Transmission lines

To benchmark TLs costs, design costs and other costs such as risk provisions, preliminaries and EPC margin fees need to be applied to each asset's separable proportion costs. Using the Genus cost spreadsheet that underpins the EPC charges the following table details the percentage design costs by asset category and other

charges as a percentage of the total. This provides the basis for TL benchmarking provided in the following subsections.

Table 8 EPC cost breakdown for benchmarking purposes

EPC cost structure breakdown	$M	% of asset category	% of total
Design substation	[redacted]	[redacted]	
Burnie substation	[redacted]		
Heybridge switching station	[redacted]		
Palmerston substation	[redacted]		
Shefield East substation	[redacted]		
Shefield West substation	[redacted]		
Subtotal substations	[redacted]		
Transmission design	[redacted]	[redacted]	
Heybridge Spur East 220 kV TL	[redacted]		
Palmerston–Sheffield	[redacted]		
Shefield to Burnie	[redacted]		
Subtotal TL	[redacted]		
Margin fee included in EPC contract	[redacted]		[redacted]
Risk provision	[redacted]		[redacted]
Escalation	[redacted]		[redacted]
Preliminaries	[redacted]		[redacted]
Total	[redacted]		

[redacted]

Transmission line costs can be influenced by terrain, remote locations, decommissioning requirements and other factors. Benchmarking sources for 220kV TL are limited and some sources represent a class 5 estimate.

GHD has used recent projects in NSW (Energy Connect, HumeLink) and in SA (Eyre Peninsula, Energy Connect) to benchmark the costs and other sources to develop benchmarks. The voltages in these projects range from 220 to 500kV, nevertheless the references could be used to calibrate the estimates for 220kV including the dismantling works.

Some of these references are detailed in the table below.

Table 9 220kV benchmark references

Reference project	Km length	Type	Source	$M per km nominal	$M per km nominal (Real$ 2024-25)
Broken Hill 220 kV Duplication (NSW, proposed)	260	220 kV single-circuit (OH)	PACR 2022	1.8 (Likely class 5)	2.1 (Likely class 5)

Reference project	Km length	Type	Source	$M per km nominal	$M per km nominal (Real$ 2024-25)
Kidston Connection (QLD, 2022–24)	186	275 kV single-circuit (OH)	Mott MacDonald 2023	1.6 (Likely class 5)	1.8 (Likely class 5)
Standard 275 kV OH line (benchmark)	50–100 km (generic)	275 kV double-circuit (OH)	Mott MacDonald 2021	2-3 (Likely class 5)	2.3 – 3.5 (Likely class 5)

The following table compares the TL cost build up to develop a cost per kilometre which is compared to the above benchmarking references.

Table 10 Transmission line benchmarking

Cost buildup	$M
Heybridge Spur East 220 kV TL	
Scope: - New easement secured with 60 m width - HB Spur East - construction of 3 km of new double-circuit 220 kV transmission line, including nine (9) new steel transmission towers - Construction of HB Spur East will facilitate the connection of Heybridge Switching Station (and therefore Marinus Link) to Sheffield–Burnie 220 kV transmission line and the broader north-west 220 kV transmission network via two 3-ended circuits: o Sheffield–Heybridge–Burnie No. 1 220 kV transmission circuit o Sheffield–Heybridge–Burnie No. 2 220 kV transmission circuit.	
Cost	[redacted]
Plus, design [redacted]	[redacted]
Plus, margin fee [redacted]	[redacted]
Plus, risk provision [redacted]	[redacted]
Plus, preliminaries [redacted]	[redacted]
Total Heybridge Spur East 220 kV TL	[redacted]
Benchmarking	
Not considered suitable for benchmarking given the high set up costs for a 3km project.	
Palmerston–Sheffield	
Scope - Construction of 80km of new double-circuit 220 kV transmission line, including 179 new steel transmission towers - Decommissioning and removal of 261 old transmission towers and associated hardware - Overall reduction in average easement width from 80 m to 50 m	
Cost	[redacted]
Plus, design [redacted]	[redacted]
Plus, margin fee [redacted]	[redacted]
Plus, risk provision [redacted]	[redacted]
Plus, preliminaries [redacted]	[redacted]
Total Palmerston–Sheffield	[redacted]
Benchmarking	
Decommissioning / dismantling costs observed in South Australia for a 210kms with 510 towers were approximately $6.0M.	

Cost buildup	$M
Using the same cost rate per km would see decommissioning and removal costs of $2.3M. Subtracting this from the cost would equate to $2.4M per km that compares to the benchmark ranges (Refer)	
Sheffield to Burnie	
Scope **Sheffield–Burnie 220 kV TL** Construction of 47 km of new double-circuit 220 kV transmission line, including 82 new steel transmission towers and 25 dual-monopole structures Decommissioning and removal of 138 old transmission towers and associated hardware Widening of the existing easement at various locations, typically comprising an easement increase of 20 m **Sheffield–Burnie 110 kV TL** Realignment of 4 km of 110 kV transmission line, including construction of 14 new steel transmission poles Decommissioning and removal of 14 old transmission towers and associated hardware.	
Cost	[redacted]
Plus, design [redacted]	[redacted]
Plus, margin fee [redacted]	[redacted]
Plus, risk provision [redacted]	[redacted]
Plus, preliminaries [redacted]	[redacted]
Total Shefield to Burnie	[redacted]
Benchmarking	
Decommissioning / dismantling costs observed in South Australia for a 210kms with 510 towers were approximately $6.0M. Using the same cost rate per km would see decommissioning and removal costs of $1.5M. Subtracting this from the cost this would equate to $2.8M per km that compares to the benchmark ranges (Refer)	

6.3 Transmission lines – variations

Under Annexure 5 of the EPC agreement, variations adjust the GMP. The following table shows the transmission lines variations that have been agreed with the Principal Contractor.

The table below details the variations that GHD has agreed to Genus variation advice.

Table 11 Transmission lines variation ($M real 2023-24)

Capital element	Total $M
Sheffield-Burnie towers to poles	[redacted]
Clear insulators	[redacted]
Total	[redacted]

Sheffield-Burnie towers to poles variation

TasNetworks Direct Capex Forecasting Methodology provides – “The original scope agreed with the Principal Contractor provides for construction of the on-alignment sections of the new TL538 Sheffield–Burnie (SH–BU) overhead transmission line (OHTL) using steel lattice towers. This was to be undertaken during a single, three-month planned outage and cutover of the existing TL504 SH–BU OHTL.

This variation will result in the construction of these on-alignment sections using steel dual-pole structures instead of lattice towers. This approach will enable construction to occur under a program of shorter day outages on the existing TL504, allowing the line to remain in service outside of those outage windows". [9]
GHD considers this variation prudent.

Clear insulator variation

TasNetworks Direct Capex Forecasting Methodology indicates that the original scope included the procurement and installation of TasNetworks' standard glass disc insulators with a dark silicon coating. Moving to uncoated clear glass disc insulators would reduce visual impact and reduce costs.

Again, GHD considers this variation prudent.

6.4 Substation direct costs

The estimate for substation costs is included within the EPC agreement with section 6.1 providing a reconciliation of TasNetworks estimate to the EPC agreement.

Reliance has been placed upon the tender process and following negotiations as GHD has not been able to identify suitable benchmarking sources, including the TCD 220kV references that are based upon TasNetwork data, limiting the usefulness of the analysis.

6.5 Substations – variations

Under Annexure 5 of the EPC agreement, variations adjust the GMP. The following table shows the transmission lines variations that have been agreed with the contractor

Table 12 Substation variations ($M real 2023-24)

Capital element	Total $M
IEC 61850 protection scheme - Sheffield	[redacted]
IEC 61850 protection scheme - Heybridge	[redacted]
SCADA standards update	[redacted]
Substation gateway works	[redacted]
Total	[redacted]

- The IEC 61850 protection scheme – Sheffield variation is based upon a variation prepared by Genus. TasNetworks Direct Capex Forecasting Methodology indicates that both Palmerston and Burnie substations already had IEC 61850 protection schemes included within their tender pricing. This variation provides for IEC 61850-based protection scheme for the bays and merging units at the Sheffield substation that was not included in the original tendered scope.

[9] TasNetworks Direct Capex Forecasting Methodology P 15

TasNetworks Direct Capex Forecasting Methodology indicates that the variation will:

- enable a consistent and standardised design across Palmerston, Burnie, Sheffield and Heybridge substations, in line with IEC 61850, which aligns both with broader industry standards and with TasNetworks' business strategy
- reduce commissioning risks at Sheffield by removing the need for copper wiring modifications
- provide sustainability benefits by reducing copper wiring which will make a significant contribution towards the Project achieving a Bronze Infrastructure Sustainability Council rating
- lower future capex and operating costs through reduced copper cabling
- reduce the requirement for spares by standardising devices across the Project

Given the benefits of standardising the design and claimed future cost reductions, GHD considers the variation as prudent.

- The IEC 61850 protection scheme – Heybridge is based upon an extrapolation of the above, which if based upon costs would be [redacted]. The difference is considered immaterial.
- The SCADA standards update is based upon a detail internal estimate based on benchmarked costs from recent brownfield substation projects involving integration of SCADA and protection systems using IEC 61850. The estimate is only marginally above the materiality threshold but is supported by detailed analysis.

6.6 Contractor risk and contingency

TasNetworks Risk and Contingency Report details that during the procurement negotiations TasNetworks procurement team worked with Genus to quantify risk allowances through detailed identification of owners and constructor risk and the development of formal risk sharing which would otherwise attract high levels of risk premium.

The Draft Risk and Contingency Price included in the OGMP was based on collaborative assessment during procurement which recognises incentivised transfer of time and cost risk to Genus through the contract and the GMP offer.

The risk & contingency price was developed for the OGMP as per the table below. These provisions were developed by Genus to inform their risk price. [redacted] then checked the provision by performing a QRA using Monte Carlo analysis detailed in section 7 and represent 5% of the total capex forecast.

These provisions are included in Annexture 20 of the EPC agreement with GHD noting that the gain share arrangement supporting the retention of provisions.

Table 13 Contingency price included in the OGMP (Only items >$1M)

Risk ref	Risk name	EMV $M
[redacted]	[redacted]	[redacted]

Risk ref	Risk name	EMV $M

Risk ref	Risk name	EMV $M

Source –

These provisions represent the direct result of negotiations between TasNetworks and Genus. The provisions are considered prudent but must be considered in conjunction with the Owner risk provisions detailed in section 7.

6.7 Other construction costs

The following table details other construction costs that have been included in the estimate of construction costs.

Table 14 Other construction cost forecast ($M real 2023-24)

Capital element	Report reference	Total $M
Heybridge bulk earthworks	Section 6.7.1	
Excavation in rock	Section 6.7.2	
Assurance of supply	Section 6.7.3	
Property management plan works	Section 6.7.4	
Contaminated material	Section 6.7.5	
Other costs	Section 6.7.6	
Total		

6.7.1 Heybridge bulk earthworks

The TasNetworks Direct Capex Forecasting Methodology indicates that the Heybridge site will house the Marinus Link convertor station and the TasNetworks Heybridge switching station, therefore forming the interface between Marinus Link and the Tasmanian transmission system.

GHD sighted the build-up of the Heybridge bulk earthworks estimate and confirmed the amount to the forecast

6.7.2 Excavation in rock

Geotechnical investigations are ongoing, but it has been considered prudent to allow a provision for some excavation to be in rock as the Principal Contractor has made minimal provisions for this activity.

[redacted]

This provision has been allowed for based on third party experience from other large-scale transmission and infrastructure projects, where unexpected subsurface conditions have frequently resulted in significant cost and schedule impacts when adequate provisions were not made. Similar projects have shown that even with comprehensive geotechnical investigations, it is not possible to fully eliminate uncertainty regarding rock conditions.

GHD views the provision as prudent with a reasonable basis or estimation.

6.7.3 Assurance of supply

This estimate is based upon a separate analysis prepared by TasNetworks. The analysis is detailed and assumes outage duration is limited to 12 weeks with temporary generation of up to 25MW, with the estimate based upon hire rates, diesel consumption and other setup and connection costs.

The TasNetworks Direct Capex Forecasting Methodology indicates by proactively making this provision, this will provide the Project with flexibility to adapt to outage constraints, support safe and timely delivery and mitigate potential reputational and financial impacts associated with supply interruptions.

GHD views the provision as prudent with a reasonable basis or estimation.

6.7.4 Property management plan works

Based on advice from [redacted] a provision has been included for property management works for [redacted] ($Real 2023-24).

TasNetworks Direct Capex Forecasting Methodology indicates that additional costs are likely associated with works required under landholder Property Management Plans (PMPs). Subject to landholder negotiations, PMPs will include provisions for property specific work to facilitate safe passage of the construction works whilst maintain ongoing property access and operations. It is anticipated PMP scopes will include works like installation of gates, fencing, cattle grids and wheel washes, and alterations to existing driveways.

As advised by [redacted] it is assumed that [redacted] of the properties will require some or all of the works noted above. [redacted]

GHD has observed similar provisioning within the HumeLink CPA submission and considers the provision prudent.

6.7.5 Contaminated material

A provision of has been made for the safe disposal of contaminated material. Site investigations are ongoing, but it has been considered prudent to allow a provision for the safe disposal of contaminated material as the Principal Contractor has made no provisions for this activity.

[redacted]

This provision has been allowed for based on standard industry practice and reflects the extent and quality of site investigations to date and the project scale/cut volume (with a large cut volume magnifying the risk exposure). Site investigations to date have involved sampling but, the full extent of site contamination across all substation sites won't be known until civil works are undertaken.

It is noted that the Heybridge site was formerly the location of a paint pigment (titanium dioxide) factory (operating between 1949 to 1996 and demolished in 1998), a fire station and areas where fire training activities occurred (from the mid-1980s to approximately 2010).

There are known contaminants on the site associated with the former paint factory, including naturally occurring radioactive materials, consisting of uranium, thorium and their decay products that occur at various concentrations in the titanium ore used at the site. The fire training activities also included the use of Per- and Poly-fluoroalkyl substances containing aqueous film forming foams.

[redacted] this contaminated material allowance will cover the safe disposal of any contaminated cut uncovered in the detailed earthworks undertaken by the Principal Contractor (along with the bulk earthworks undertaken by the Principal Contractor on other substation sites).

GHD consider that the provision is prudent.

6.7.6 Other costs

This cost element identifies scope items have been identified that have not been allocated to the EPC contractor. These items are all below GHD's materiality threshold and in total [redacted] ($Real 2023-24) is only [redacted] of the total capex forecast.

6.8 Direct construction forecast conclusion

92% of the direct construction costs forecast is supported by the EPC agreement and contract variations. These were concluded based upon negotiations between TasNetworks and Genus. The EPC agreement structure is based upon a cost-plus margin and administrative fee arrangement with a GMP and capped risk allowance, both subject to a gain sharing agreement which is considered an effective mechanism to drive positive project management delivery.

Benchmarking of TL and costs indicate indicates alignment with reference projects, noting that 220kV references are limited. Reliance has been placed upon the tender process and following negotiations as GHD has not been able to identify suitable benchmarking sources.

The remaining forecast elements are either based upon third party advice or detailed estimation.

7. Project risks

The NWTD CPA-2 capital forecast includes a risk and additional contingency allowance of $131.5M which represents 13% of the total forecast. This represents a P50 estimate added to the base capital forecast estimate, for contingent and inherent schedule risks associated with the delivery of stage 1 of the NWTD.

The table below sets out a summary of the NWTD risk allowance.

Table 15 Risk allowance NWTD Stage 1 construction and delivery ($ million, real 2023 24)

% (P)	Contingent Allowance $M	Schedule Allowance $M	Risk and Contingency Allowance (P50) $M	Risk and Contingency Allowance (P80) $M	Management Reserve (P80 - P50) $M
P50	56.4	75.2	131.5	-	-
P80	76.7	99.3	-	176.1	44.5

Source – TasNetworks Direct Capex Forecasting Methodology

The AER's guidance note on the regulation of actionable ISP projects states that it can accept a project risk allowance for a contingent project where[10]:

- Residual risks have been identified
- The associated cost estimates of the residual risk are efficient i.e., the consequential cost adjusted to reflect the likelihood of occurrence.

To inform its assessment, the AER requires a comprehensive and transparent explanation of how the risks have been identified and costed, including[11]:

- Risk identification, i.e., clearly identifying the risk events
- Risk cost assessment, i.e., estimating the potential cost impacts, the likelihood of occurrence, the consequential costs, and any mitigation/management strategies.

TasNetworks through their Risk and Contingency Report has satisfied these requirements.

Across the following sections, the risk and contingency allowance development has been assessed to ensure that:

- Material risks have been identified and measured appropriately
- Monte Carlo QRA methodology captures contingent and inherent risks appropriately
- Risk sharing mechanisms (i.e. the contract risk and contingency) are properly accounted for, without duplication
- Resulting contingency is within expected ranges through external benchmarking.

[10] AER, Guidance Note, Regulation of actionable ISP project, March 2021
[11] AER, *Regulation of actionable ISP projects,* Guidance note, March 2021, p 17

7.1 Risk identification and measurement

TasNetworks compiled a detailed risk register (NWTD Stage 1 Risk Register – Sept 2025) which serves as a central repository of identified threats and opportunities. The risks were identified through workshops with subject matter experts, internal workstream leads and consultants. Where possible, risk ownership was transferred to third parties that was in better position to manage such risks (e.g. the contractor risk and contingency).

TasNetworks Risk and Contingency Report details that for each risk, a ‘base estimate’ was determined. In terms of delay costs, the maximum daily delay rate from the estimate is used. The allowance was used to calculate the estimate for the ‘likely outcome’ value which is the basis of the QRA.

To derive the cost impact and define risk factor distributions, the approach implements the ‘3-point cost estimate’ process which is a standard and robust project estimating methodology. This technique uses three figures that are produced initially for every distribution that is required, based on prior experience and/or an estimate. The three ‘points’ were categorised as follows:

– Low Cost if Realised (or Optimistic scenario) represents cost value based favourable level of confidence based on best-case scenario.
– Most Likely Cost if Realised (or Realistic estimate) represents the most realistic cost value.
– High Cost if Realised (or Pessimistic scenario) represents the cost value unfavourable conditions are experienced.

The estimation of risk time and cost impacts was completed based on 30% design scope. Workshops were held with relevant stream leads and project SMEs to determine probabilities and order of magnitude impact allowance (considered reasonable given only 30% design held).

The following table sets out a selection of risks (by most likely cost impact) and our assessment of the efficiency and prudency.

Table 16 Risk selection

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations
[redacted]						

Risk description	Causes	Probability schedule	Probability cost	Day delay schedule	EMV cost($M	GHD considerations

7.2 Monte Carlo QRA

Having identified the risks qualitatively, TasNetworks translated them into a QRA to determine how much contingency money and time should be set aside. The QRA for NWTD Stage 1 is documented in the Risk and Contingency Report (Sept 2025), Sections 6–9, with detailed appendices for each risk category's data.

TasNetworks used a Monte Carlo simulation tool to model the combined effect of all identified risks on project cost and schedule. Key elements of the setup:

– Risk Inputs: For each retained risk from the register, inputs include:
  - Probability of Occurrence (Residual Likelihood)
  - Impact Range: Expressed as an Optimistic (minimum), Most Likely, and Pessimistic (maximum) value for cost impact (in $) and, if applicable, schedule impact (in days). For example, risk [redacted] These three points informed the assumed PERT distribution for simulation of that risk's outcome.
  - Risk Interdependencies: If two risks are correlated [redacted] Monte Carlo needs correlation factors to avoid unrealistic independence assumptions. The report indicates a correlation matrix was used (Table 16).
– Simulation Process**:** The Monte Carlo simulation runs a large number of trials (typically 5,000 or 10,000). In each trial, it:
  - Randomly decides for each risk whether it occurs (based on its probability).
  - If it occurs, randomly samples a cost outcome from that risk's distribution (and similarly a schedule delay outcome if modelled).
  - Sums up the cost impacts of all occurring risks to get total cost impact for that trial. Separately, schedule impacts are handled via a separate dedicated schedule simulation.
  - Repeats many times to build a distribution of possible total cost outcomes.
– Outputs: The result is a probability distribution of potential project cost outcomes *above the base estimate*. The report highlights specific percentiles:
  - P50 (50% or median) – the contingency such that there's a 50% chance actual risk cost will not exceed it (so project has ~50% chance to come under budget).
  - P80 (80% or "P80 target") – a higher confidence amount, meaning 80% chance risk cost will not exceed it (i.e., only 20% chance of overrun beyond P80).

An independent review of the risk quantification was undertaken by [redacted] The review found that:

– The process and methodology used was consistent with Industry Practice and ISO 31000:2018
– The overall P50 and P80 contingency values fall within the anticipated range when compared to comparable projects
– Appropriately, TasNetworks engaged an external Risk SME to manage the risk quantification process.

7.2.1 Contingent allowance

The contingent allowance of $56.4M refers to the provision made to account for contingent risks (i.e. discrete unforeseen risk events which could impact the project). This value is determined through Monte Carlo simulation and is the P50 output of the risk model.

As GHD have reviewed and found the risk model inputs and QRA methodology to be reasonable and appropriate, the contingent allowance of $56.4M as a model output was considered prudent.

7.2.2 Schedule allowance

The schedule allowance was determined separately to the contingent allowance, although with a similar methodology. Risk events were modelled in Primavera Risk Analysis to determine the P50 schedule impacts to the following milestones:

– Fulfilment of all conditions to start construction

– Practical completion.

The results of the analysis are presented in the following table.

Table 17 Schedule allowance (Real, 2025)

Milestone	Deterministic	Delay P50 (days)	Delay cost (per day)	P50 Cost ($M)

7.3 Risk-sharing mechanism

TasNetworks allocated a significant portion of risk to the party best able to manage it – the EPC contractor – within a GMP framework. This approach is beneficial for multiple reasons:

– It reduced the overall risk contingency needed by preventing duplication of risk funding. The contractor's [redacted] risk allowance is essentially part of the contract price; had TasNetworks not done a GMP, they might have had to carry a larger owner contingency to cover those construction risks. Instead, it's built into the fixed price (with some unused risk portion returning through gainshare if not needed).
– It incentivises minimising costs to consumers by transferring risk to where it can be managed cheaper. The contractor will try to come under that risk allowance to earn gainshare – a motivator for efficiency that wouldn't exist if all risk lay with TasNetworks. [redacted] That could reduce actual outturn cost below the P50 forecast, which customers benefit from via CESS.
– We see that not all risk can be transferred (e.g., regulatory delays, extreme events), and TasNetworks appropriately retained those. We consider this division rational: [redacted] so TasNetworks retains those and holds contingency. Meanwhile, contractor can control [redacted] so those are in the GMP scope.

Annexure 20 of the EPC contract includes a risk register developed by Genus in conjunction with TasNetworks, forming the basis of the [redacted] in contractor risk and contingency (refer to section 6.6). This risk register was reviewed and compared to the risk register forming the basis of the TasNetworks Monte Carlo QRA, to ensure no duplication of risks. The table below includes the risks with potential for duplication and our assessment.

Table 18 Risk-sharing mechanism duplication assessment

Risk ID	Risk description	Key consequence	GHD assessment
[redacted]			

Risk ID	Risk description	Key consequence	GHD assessment

Risk ID	Risk description	Key consequence	GHD assessment
[redacted]			

7.4 Risk benchmarking

The table below shows the NWTD risk and contingency allowance benchmarked against comparable Australian electricity transmission network infrastructure projects.

The $131.5M P50 NWTD contingency corresponds to 13% of the $977.6M Stage 1 base capex (excl. early works). This percentage is higher than the CWO REZ network enabling works (Transgrid Scope) and HCC RNIP (3.9% and 8.0%, respectively) and similar to the contingency percentage estimated for in the HumeLink CPA-2.

HumeLink is the best comparison given that the contract is based upon an incentivised target cost structure and is delivered over difficult terrain. HumeLink has two contractor interfaces with the risk provision representing the risks retained by Transgrid. Given the size of the NWTD compared to HumeLink the percentage of the risk provision to the total capex forecast would be expected to be higher than provided. In summary, the NWTD benchmarks favourably at this stage of the project's development.

Table 19 Risk and contingency benchmarking

Project	Total project estimate $M	Contingency estimate $M	% of total project capex
HumeLink CPA-2	4,279.1	599.1	14%
NWTD	**977.6**	**131.5**	**13%**
HCC RNIP	600.9	48.0	8.0%
CWO enabling works (Transgrid scope only)	437.9	17.1	3.9%

7.5 Project risk conclusion

Overall, our assessment of the NWTD Stage 1 risk and contingency allowance finds that:

– The NWTD Stage 1 risk register captures a broad spectrum of risks (technical, environmental, property, stakeholder, commercial), each with defined causes, consequences, and owners. The major risk categories typical of a large transmission project appear to have been examined. Each risk's residual likelihood and impact range were assessed by NWTD (or external) subject-matter experts, forming the foundation of the quantitative analysis.

– TasNetworks conducted a Monte Carlo simulation using @Risk (or similar), modelling ~80+ discrete risk events with three-point cost and schedule estimates. The QRA produced a probabilistic distribution of total project risk cost, from which the P50 and P80 values were derived.

– The risk analysis separates owner-retained risks from contractor risks, which confirms that contingent and inherent risks on the owner's side are captured without material overlap.

– The $131.5M P50 contingency corresponds to roughly 13% of the Stage 1 base capex (excl. early works). This was benchmarked against comparable projects and found to be reasonable.

8. Land and property

Land and property costs relate to landholder compensation and compulsory acquisition costs for transmission line easements. The table below provides a breakdown of the cost forecast.

Table 20 Land and property forecast ($M real 2023-24)

Capital element	Report reference	Total $M
Land acquisition	Section 8.1	[redacted]
Land acquisition compensation - additional easement compensation	Section 8.2	[redacted]
Legal costs	Section 8.3	[redacted]
Surveys	Section 8.4	[redacted]
Other items <$100K	Not material	[redacted]
Total		**78.9**

8.1 Land acquisition compensation

Land acquisition compensation costs have been estimated by JLL. The land acquisition will occur across three phases:

– Phase 1: Voluntary transmission easement acquisition process

– Phase 2: Voluntary acquisition of other land and easements

– Phase 3: [redacted]

All land acquisition costs have been agreed to external estimate completed by JLL and considered to be efficient and required to deliver the project scope.

The following table below sets out the land acquisition compensation costs as presented in the JLL Compensation Report and our assessment.

Table 21 Land acquisition compensation costs ($M, June 2024)

Capital element	Total $M	GHD assessment
Land acquisition compensation – transmission easements	[redacted]	The estimate for land acquisition compensation for transmission line easements is based on a compensation estimation report completed by JLL with regard to the Land Acquisition act 1993 (Tas). A breakdown of these costs is provided in Table 22.
Land acquisition compensation – Right of Way easements	[redacted]	[redacted] for land acquisition for Right of Way easements for construction and ongoing maintenance. Allowance for [redacted] affected owners, and market value of [redacted] per hectare. Supported by JLL cost estimation report.
Land acquisition compensation – distribution easements	[redacted]	[redacted] for land acquisition for distribution easements for realignment / undergrounding of existing distribution infrastructure.

Capital element	Total $M	GHD assessment
		Allowance for a construction licence calculated at [redacted] of market value of the easement area for [redacted] occupation. Supported by JLL cost estimation report.
[redacted]	[redacted]	[redacted]
Stamp duty on land acquisition	1.6	$1.6M payable upon acquisition of easements assessed by JLL as part of compensation estimation. Supported by JLL cost estimation report.
[redacted]	[redacted]	[redacted]
[redacted] acquisition valuation support	[redacted]	[redacted] for acquisition valuation support services. Assumed [redacted] individual assessments at [redacted] each and other additional assessments.
Brake and winch sites compensation and professional fees	[redacted]	[redacted] for land acquisition for temporary occupation for construction. Allowance for [redacted] individual sites at market value of [redacted] per hectare.
Total	[redacted]	

Table 22 Land acquisition valuation for transmission easements ($M, June 2025)

Capital element	Low	High	Adopted
Palmerston to Sheffield	[redacted]	[redacted]	[redacted]
Sheffield to Burnie	[redacted]	[redacted]	[redacted]
Heybridge to Spur	[redacted]	[redacted]	[redacted]
Other areas (access, distribution, and temporary occupation)	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]
Total (June 2024)	[redacted]	[redacted]	[redacted]

8.2 Additional compensation

The additional land acquisition costs consist of $3.7M for additional compensation above the JLL estimate [redacted] As these negotiations are finalised, updated valuations for these specific properties will be available. [redacted] Given that these costs are required to deliver the project and that updated valuations will be available once finalised, these costs were considered reasonable and prudent.

The table below outlines the specific properties where additional compensation is expected to be required, and the expected additional costs.

Table 23 Additional compensation costs ($M, June 2025)

Capital element	Total $M
Palmerston to Sheffield	
Sheffield to Burnie	
Heybridge to Burnie	
Total	
Total (June 2024)	

8.3 Legal costs

The land and property legal costs consist of to provide legal support

The table below sets out the breakdown in forecast land and property legal costs. These costs were agreed to a cost estimate from and considered to be efficient and required to deliver the project or reduce risk.

Table 24 Land acquisition legal costs ($M, June 2025)

Capital element	Total $M

Capital element	Total $M
[redacted]	

8.4 Survey costs

The land and property survey costs of [redacted] to provide professional surveying services to support land and easement acquisition.

The table below sets out the breakdown in forecast land and property survey costs. These costs were agreed to a cost estimate from [redacted] and considered to be efficient and required to deliver the project or reduce risk.

Table 25 Land surveying services ($M, Real June 2025)

Capital element	Total $M
[redacted]	

8.5 Land and property conclusion

Land and property costs relate to landholder compensation [redacted] for transmission line easements. The forecast is supported by external estimates from JLL and other third parties.

9. Labour and indirect costs

Labour and indirect costs represent the incremental costs required to undertake the construction and delivery works of Stage 1 of the NWTD. The costs include:

– Incremental labour roles from September 2025 to February 2026 that were not included in the Early Works CPA-1

– Forecast labour and indirect costs from March 2026 to June 2030.

The above incremental labour roles and forecasted labour and indirect costs have been estimated based on:

– The FTE profile and numbers required to deliver each project objective to support delivery

– The month-by-month FTE requirements for each role type to meet the project schedule

– Hourly labour rates for each role type, including on-costs such as superannuation, long service leave, etc.

Across the following sections, those material cost elements have been assessed through:

– Verified the forecast to the supporting spreadsheets that have been used to generate labour and indirect cost forecasts

– Extracted and analysed the phased FTE profile to consider the appropriateness of roles and numbers required to deliver project stream objectives

– Considered the reasonableness of hourly rates applied by role in the forecast

– Performed a simple extension of the phased FTE profile by the hourly rates to confirm the material correctness of the forecast

– Where possible, performed a benchmarking assessment to similar projects to further assess reasonableness.

The following table presents the labour and indirect forecast costs with the GHD assessment presented in the following sections.

Table 26 Labour and indirect cost forecast ($M, June 2024)

Labour and indirect cost element	Section reference	Total $M
Commercial and procurement	Section 9.2	12.0
Community and stakeholder engagement	Section 9.3	15.2
Land and property	Section 9.4	6.2
Planning and statutory assessment	Section 9.5	0.7
Project execution	Section 9.6	45.7
Project management	Section 9.7	48.2
Total		**128.1**

9.1 Labour rates

TasNetworks' NWTD Stage 1 CPA uses a labour cost model [redacted] for internal staff. The model defines a base salary range for each band and applies standard on-costs (12% super, 2% long-service leave, 6% payroll tax, etc.) to get internally fully loaded costs.

Below, we benchmark the average monthly fully loaded labour rates in each NWTD workstream (Commercial & Procurement, Community and Stakeholder Engagement, Land & Property, Planning & Statutory, Project Execution, Project Management) against comparable anonymised NSW Australian transmission projects. We ensure as close a comparison as practicable by aligning roles with workstreams, accounting for on-costs (superannuation, etc.) and de-escalation to June 2024 dollars.

The labour rates applied by TasNetworks fall below the rates applied in the two comparable projects. This is considered reasonable due to several factors:

- **Internal resourcing strategy:** TasNetworks' deliberate strategy to prefer internal resourcing rather than rely on more expensive external consultants results in lower overall labour rates
- [redacted]
- **Reduced competition for talent:** With several major transmission construction projects competing for labour talent, this has driven up labour costs on the mainland. NWTD is the only transmission project occurring in Tasmania and so TasNetworks face less local talent competition.
- **Lower regional labour costs:** Tasmania's economy has a lower wage structure than other Australian States which contributes to the labour rates applied to TasNetworks' internal staff. The Australian Bureau of Statistics reports than average full-time salary of $1,793 per week in Tasmania compared with $2,052 in NSW or $1,959 in Victoria[12].

[12] **Average Weekly Earnings, Australia, May 2025 | Australian Bureau of Statistics**

Figure 3 Average monthly rates by workstream (Real, 2023-24)

9.2 Commercial and procurement costs

9.2.1 Labour costs

The forecast commercial and procurement labour costs to 30 June 2026 of $6.8M relate to activities including assessment and engagement of specialist service providers, project budget and contract management, and managing project financing.

The forecast commercial and procurement labour costs are based on the:

– Commercial and procurement team roles and associated salary band

– Forecast monthly FTE for each role.

The team is forecasted to consist of 8 FTEs for most of the project from March 2026 onwards. The phased FTE profile is provided below and consists of the resources required to achieve the projects stream objectives.

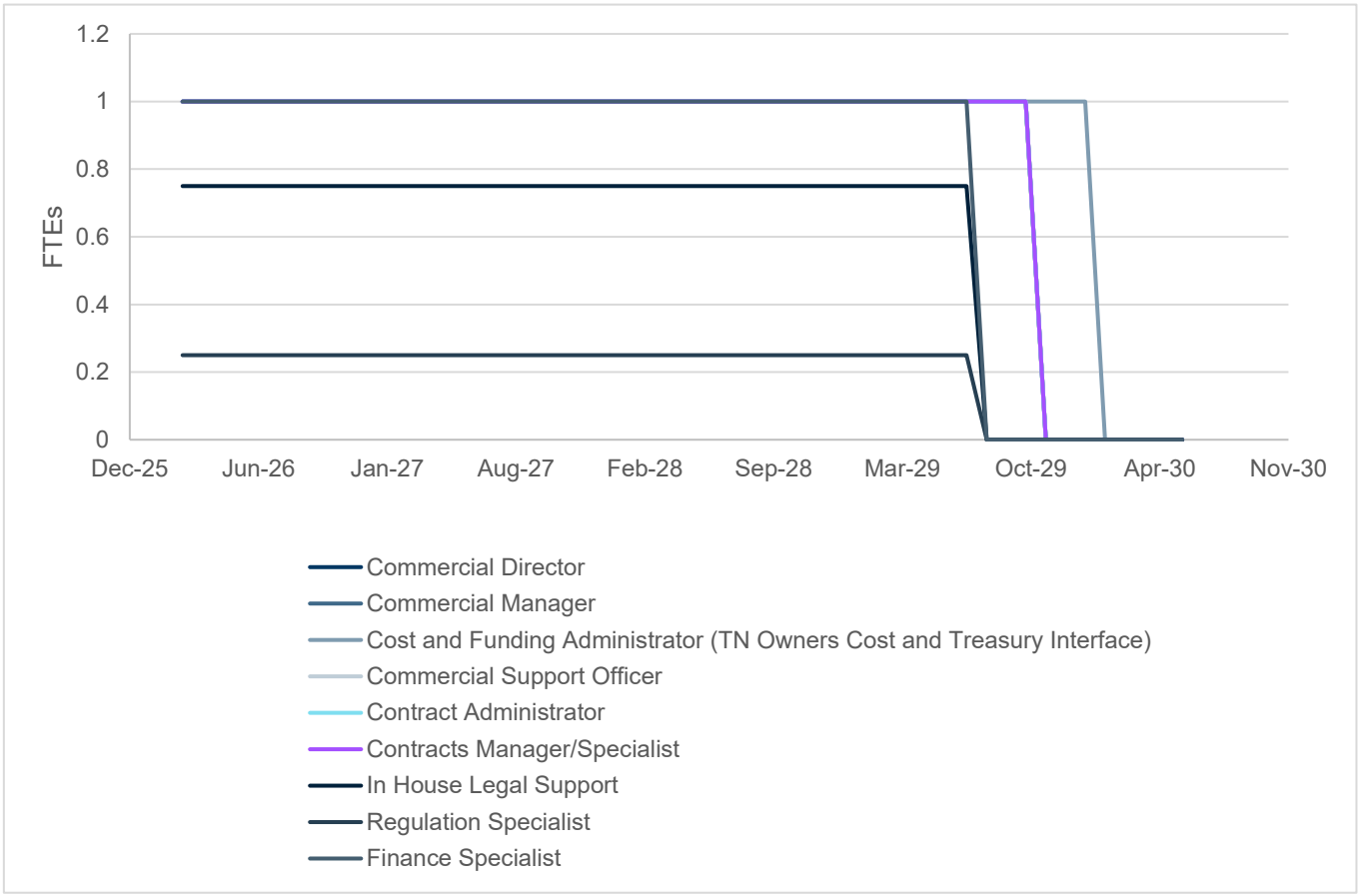

Figure 4 ***Commercial and procurement phased FTE profile***

9.2.2 Indirect costs

The forecast indirect commercial and procurement costs to June 2030 of $5.3M includes costs related to the engagement of external service providers/consultants to provide legal, commercial and strategic advice regarding debt facility financing and the EPC contract with Genus.

Table 27 ***Commercial and procurement indirect costs ($M, June 2024)***

Description	GHD verification	$M
[redacted] legal advice	[redacted] to undertake services related to financing and construction for period March 2026 to June 2029. [redacted] cost estimate sighted and totalled [redacted] [redacted] was claimed in Early Works CPA for services until February 2026.	[redacted]
[redacted]		

Description	GHD verification	$M
[redacted] external audit of contractor claims	[redacted] for external auditing/assurance of contractor's monthly claims to verify actual costs incurred and facilitate the GMP model. [redacted] proposal sighted with estimated fee schedule from June 2026 – June 2029 totalling [redacted]	[redacted]
Various <$1M	Other costs individually < $1M Not assessed because under materiality threshold amount	[redacted]
Total		**5.3**

9.3 Community and stakeholder engagement costs

9.3.1 Labour costs

The forecast community and stakeholder engagement labour costs to 30 June 2026 of $3.6M relate to activities including implementing the Construction Communications and Engagement Strategy.

The forecast community and stakeholder engagement labour costs are based on the:

– Community and stakeholder engagement team roles and associated salary band

– Forecast monthly FTE for each role.

The team is forecasted to consist of 6.8 FTEs from March 2026 to March 2027, then decreasing to 5.8 onwards. The phased FTE profile is provided below and consists of the resources required to achieve the projects stream objectives.

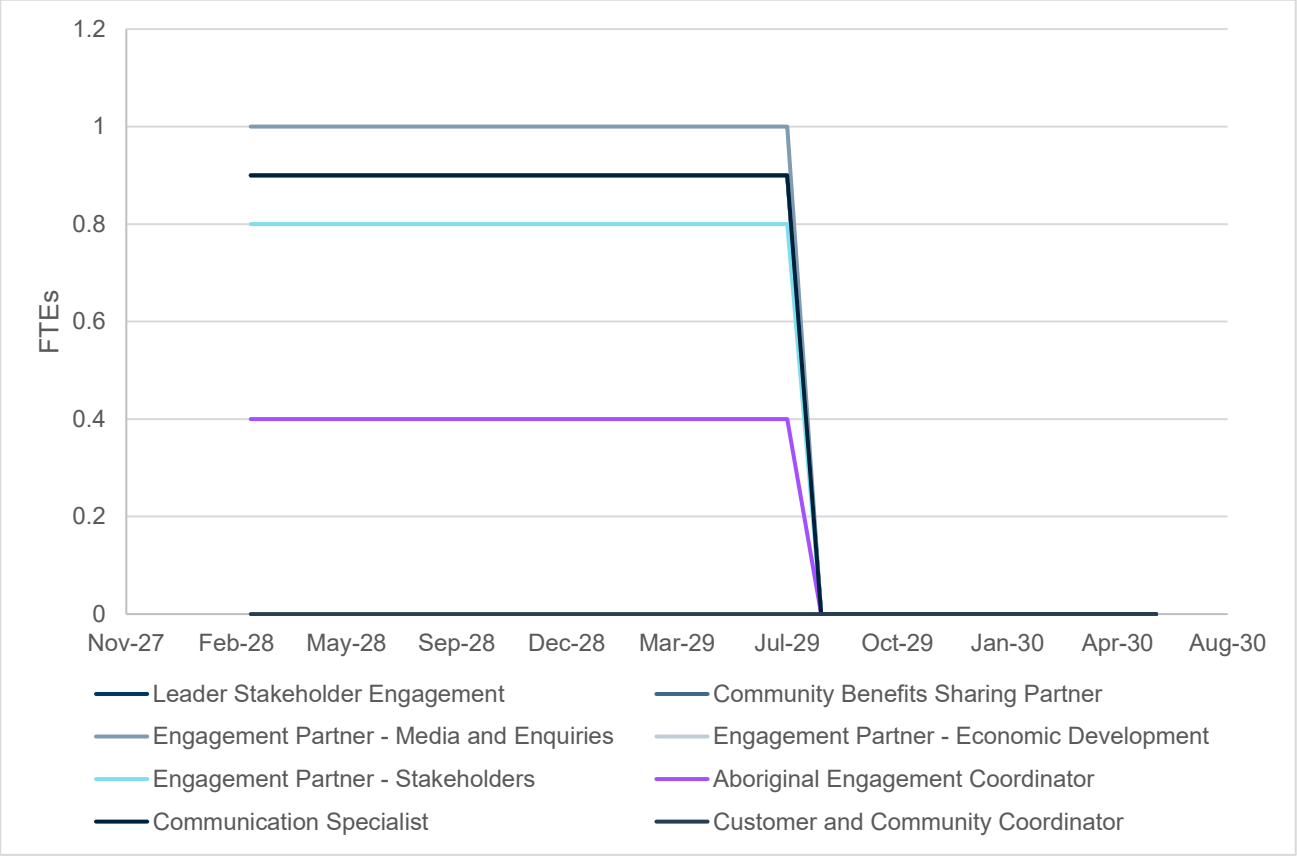

Figure 5 Community and stakeholder engagement phased FTE profile

9.3.2 Indirect costs

The forecast indirect community and stakeholder engagement costs to June 2030 of $11.6M includes costs related to the CSBP, engagement of external engagement advisory services, and communications costs including advertising.

Table 28 Community and stakeholder engagement indirect costs ($M, June 2024)

Description	GHD verification	$M
CBSP	$10.0M for the establishment of the CBSP. The CBSP will deliver funding for projects and activities that benefit communities impacted by the NWTD project. The program includes governance arrangements to manage the assessment of applications for funding and ongoing monitoring and reporting requirements. The level of oversight will be dependent on the tier of funding applicable. There are four tiers as follows: – Tier 1: Less than $5,000 – Tier 2: Between $5,000 and $50,000 – Tier 3: Between $50,000 and $250,000 – Tier 4: Greater than $250,000. Other recent projects under EnergyCo direction have required social licence programs, the HCC RNI has a program of $5M which represents 0.8% of its total forecast. The HumeLink project includes $15.6M for their Community and Stakeholder Engagement Plan (0.4% of the total forecast) and an additional 0.4% of the Incentivised Target Cost Contract costs ($2.6B) directed to community, social license and community benefits.	10.0
Various <1M	Other costs individually < $1M	1.6
Total		**11.6**

9.4 Land and property costs

9.4.1 Labour costs

The forecast land and property labour costs to 30 June 2026 of $5.0M relate to land acquisition and providing support to landholders.

The forecast land and property labour costs are based on the:

– Land and property team roles and associated salary band

– Forecast monthly FTE for each role.

The team is forecasted to consist of 6.1 FTEs. The phased FTE profile is provided below and consists of the resources required to achieve the projects stream objectives.

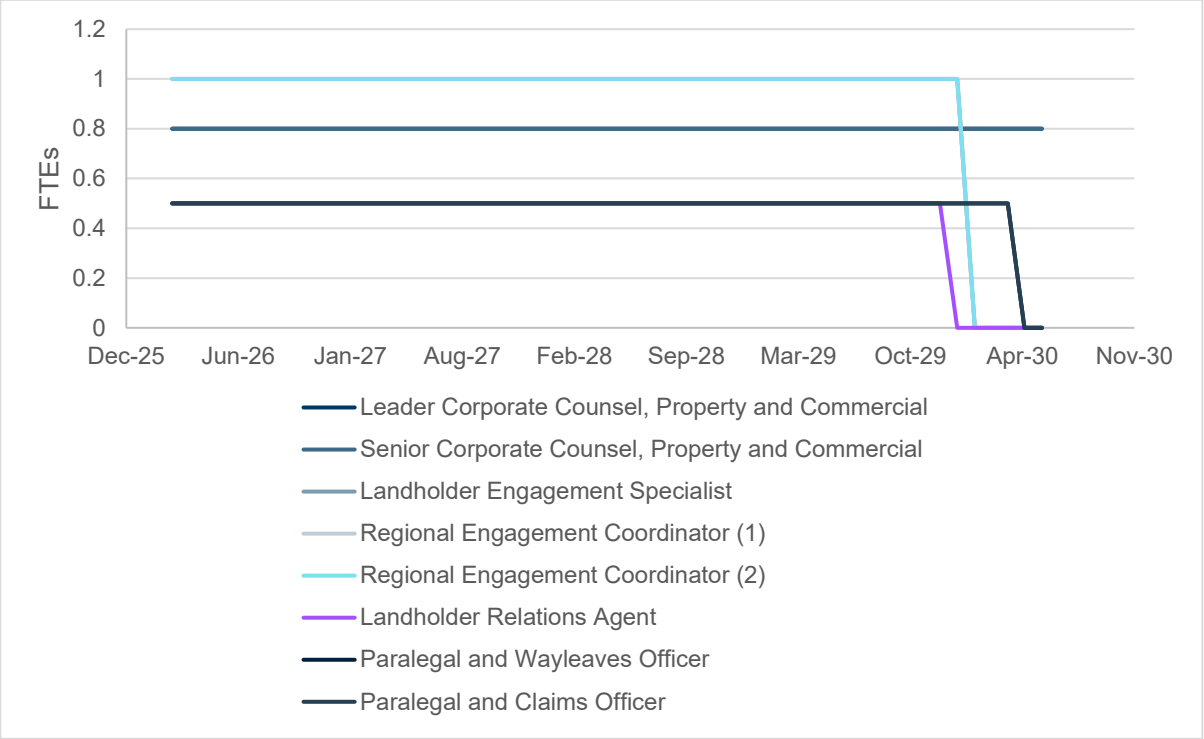

Figure 6 Land and property phased FTE profile

9.4.2 Indirect costs

The forecast indirect land and property costs to June 2030 of $1.2M includes costs related to the engagement of external service providers to conduct [redacted] risk assessments, [redacted] and soil testing and remediation to ensure impacts to farming properties are managed.

Table 29 Community and stakeholder engagement indirect costs ($M, June 2024)

Description	GHD verification	$M
[redacted] risk assessment	[redacted] risk assessment services from [redacted] Rough Order of Magnitude Cost Estimate sighted by GHD and agreed to cost. Cost estimate based on assumption [redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted] to perform soil testing on [redacted] properties at [redacted] per property. [redacted] quote provided and agreed to cost.	[redacted]
Total		**1.2**

9.5 Planning and statutory assessment costs

9.5.1 Labour costs

The forecast planning and statutory assessment labour costs to 30 June 2026 of [redacted] relate to the submission of require permits and approvals and compliance and monitoring activities.

The forecast planning and statutory assessment labour costs are based on the:

– Planning and statutory assessment team roles and associated salary band

– Forecast monthly FTE for each role.

The team is forecasted to consist of 0.75 FTEs. The phased FTE profile is provided below and consists of the resources required to achieve the projects stream objectives.

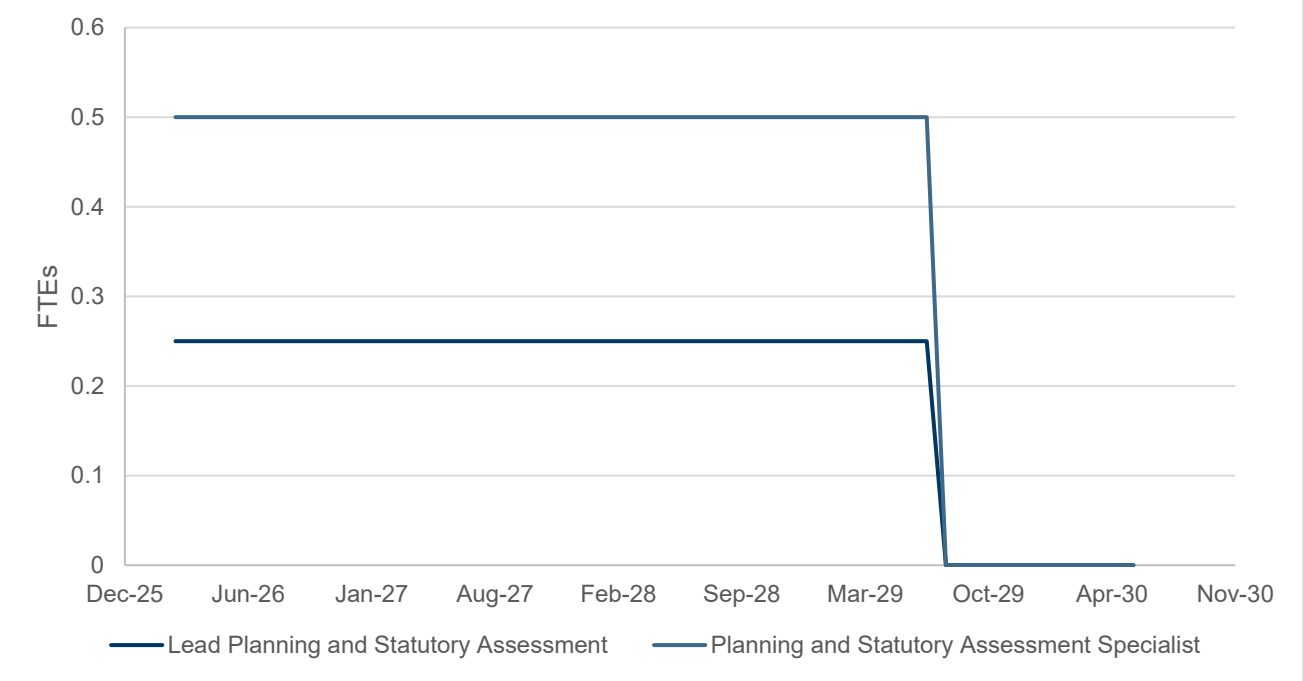

Figure 7 Planning and statutory assessment phased FTE profile

9.5.2 Indirect costs

The forecast indirect planning and statutory assessment costs to June 2030 of [redacted] relates to engagement of [redacted] to undertake on-ground eagle mortality studies.

Table 30 Community and stakeholder engagement indirect costs ($M, June 2024)

Description	GHD verification	$M
Eagle mortality studies	[redacted] for eagle mortality surveys across north-west region and northern midlands region. Cost estimate sighted and agreed to cost.	[redacted]

9.6 Project execution costs

9.6.1 Labour costs

The forecast project execution labour costs to 30 June 2026 of $42.7M relate to activities related to direct management of the Principal Contractor (Genus) and supplementing the Business as Usual (BAU) TasNetworks teams to enable contracted works to be implemented.

The incremental labour will sit within existing TasNetworks work streams and will only work on the NWTD project (i.e. not on BAU activities). Timesheets will be used to delineated costs between the project and BAU.

The forecast land and property labour costs are based on the:

– Project execution team roles and associated salary band
– Forecast monthly FTE for each role.

The team is forecasted to peak at 49 FTEs in the early stages of the project before reducing to 47.5 for most of the remainder. The phased FTE profile is provided below.

The project execution team consists of the following roles and consists of the resources required to achieve the projects stream objectives:

– Project director
– Project manager execution
– Reporting and compliance manager
– Personal assistant to Project Director
– Project administrator
– Marinus interface manager
– Engineering and design lead
– Commissioning lead
– Construction manager – Substations
– Construction manager – Distribution and EHV lines
– Specialist project engineer (various)
– Project engineer
– Outage planner
– Outage assessor
– Outage coordinator
– Transmission line asset engineer
– Primary asset engineer
– Secondary asset engineer SCADA
– Secondary asset engineer protection
– Graduate engineer (3)
– Projection and control field technician (2)
– EHV operator (3)
– Technical coordinator – substations (2)
– Technical coordinator – lines (2)
– Distribution operator (2)
– Distribution outage planner
– EHV linesman (3)
– Secondary field engineer
– SCADA engineer
– Telecommunications engineer
– Telecommunications network operations engineer
– People partner
– Talent specialist
– HR Coordinator
– Safety specialist (3)
– Environmental specialist (3)
– RTO trainer
– RTO administrator.

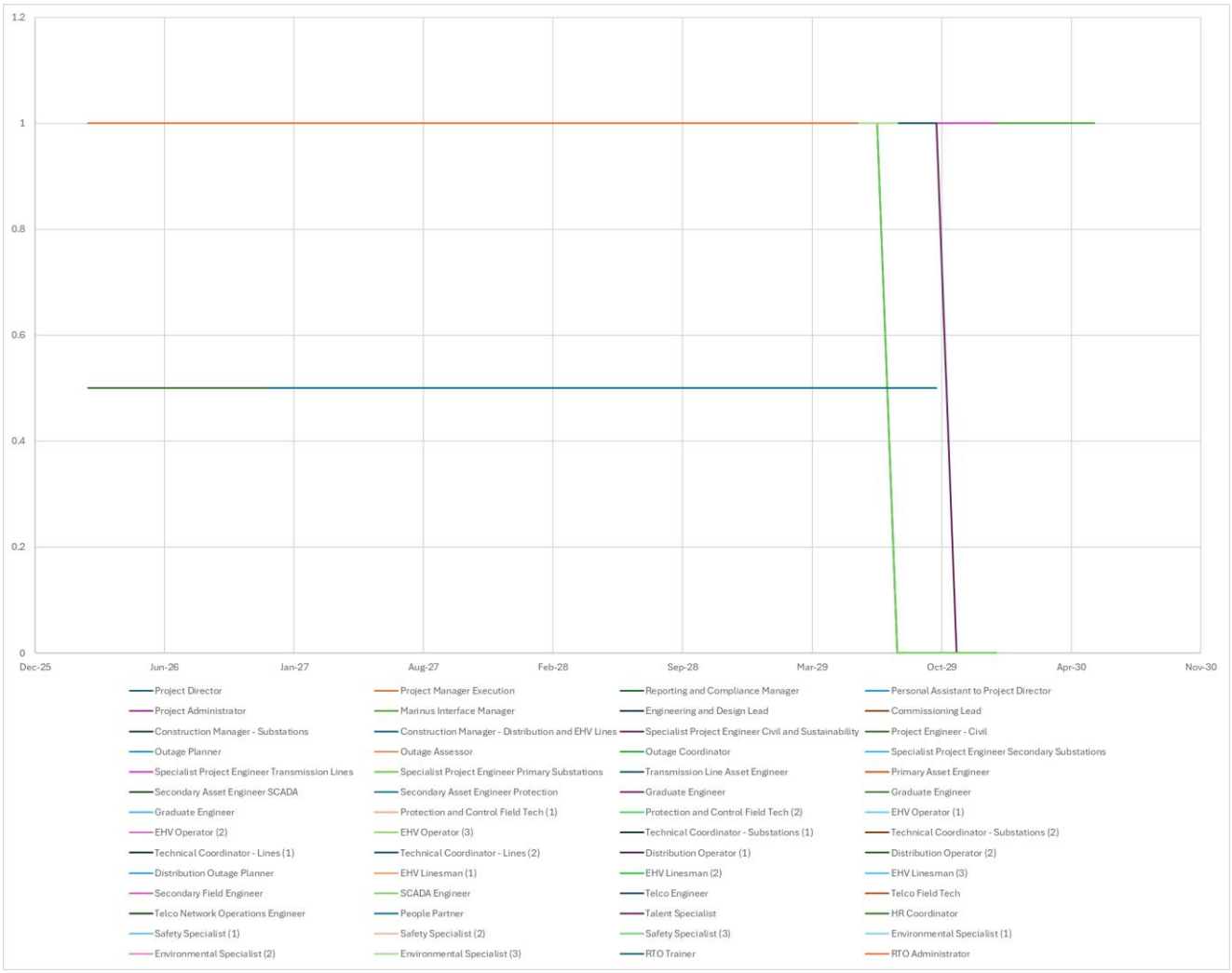

Figure 8 Project execution phased FTE profile

The project execution labour costs were benchmarked against similar transmission projects in Australia. The costs considered were the forecast costs considered within the associated cost submissions. The results are presented in the following table.

The NWTD CPA-2 project execution costs represent 4.4% of the total forecast.

Based on the benchmarking, the NWTD CPA-2 costs are considered consistent with other comparable projects after taking into account the size of the project, as illustrated below.

Table 31 Project management labour cost benchmarking ($M, various)

Project	Capital forecast $M	Project execution labour costs $M	Percentage of capital forecast
CWO enabling works (Transgrid scope only)	437.9	26.8	6.1%
NWTD CPA-2	**978.1**	**42.7**	**4.4%**
Project EnergyConnect CPA-2	2,271	61.5	2.7%
HumeLink CPA-2	4,279.1	85.4	2.0%

9.6.2 Indirect costs

The forecast indirect project execution costs to June 2030 of $3.0M includes costs related to specialist engineering support, cadastral surveys, air surveys of transmission lines, and telecommunication upgrades.

Table 32 Community and stakeholder engagement indirect costs ($M, June 2024)

Description	GHD verification	$M
[redacted] specialist engineering support	[redacted] to provide specialist engineering support during construction between March 2026 and June 2029. Cost estimate provided and agreed to forecast.	[redacted]
Cadastral survey	Not considered material	[redacted]
Various <1M	Other costs individually < $1M	[redacted]
Total		**3.0**

9.7 Project management costs

9.7.1 Labour costs

The forecast community and stakeholder engagement labour costs to 30 June 2026 of $21.6M relate to activities including the establishment of a Project Management Office (PMO) which will have overall responsibility for governance and managing and coordinating the project's activities to deliver to schedule and budget.

The forecast project management labour costs are based on the:

– Project management team roles and associated salary band
– Forecast monthly FTE for each role.

The team is forecasted to consist of 12.75 FTEs from March 2026 to November 2027, then decreasing to 11.75 onwards. The phased FTE profile is provided below.

The project management team consists of the following roles:

– Leader PMO
– GIS Analyst
– Systems and information specialist
– Quality assurance and governance specialist
– Project control lead
– Lead estimator
– Data analyst
– Cost administrator
– Cost controller
– Risk manager
– Document controller
– Senior planner
– Change manager
– Planner

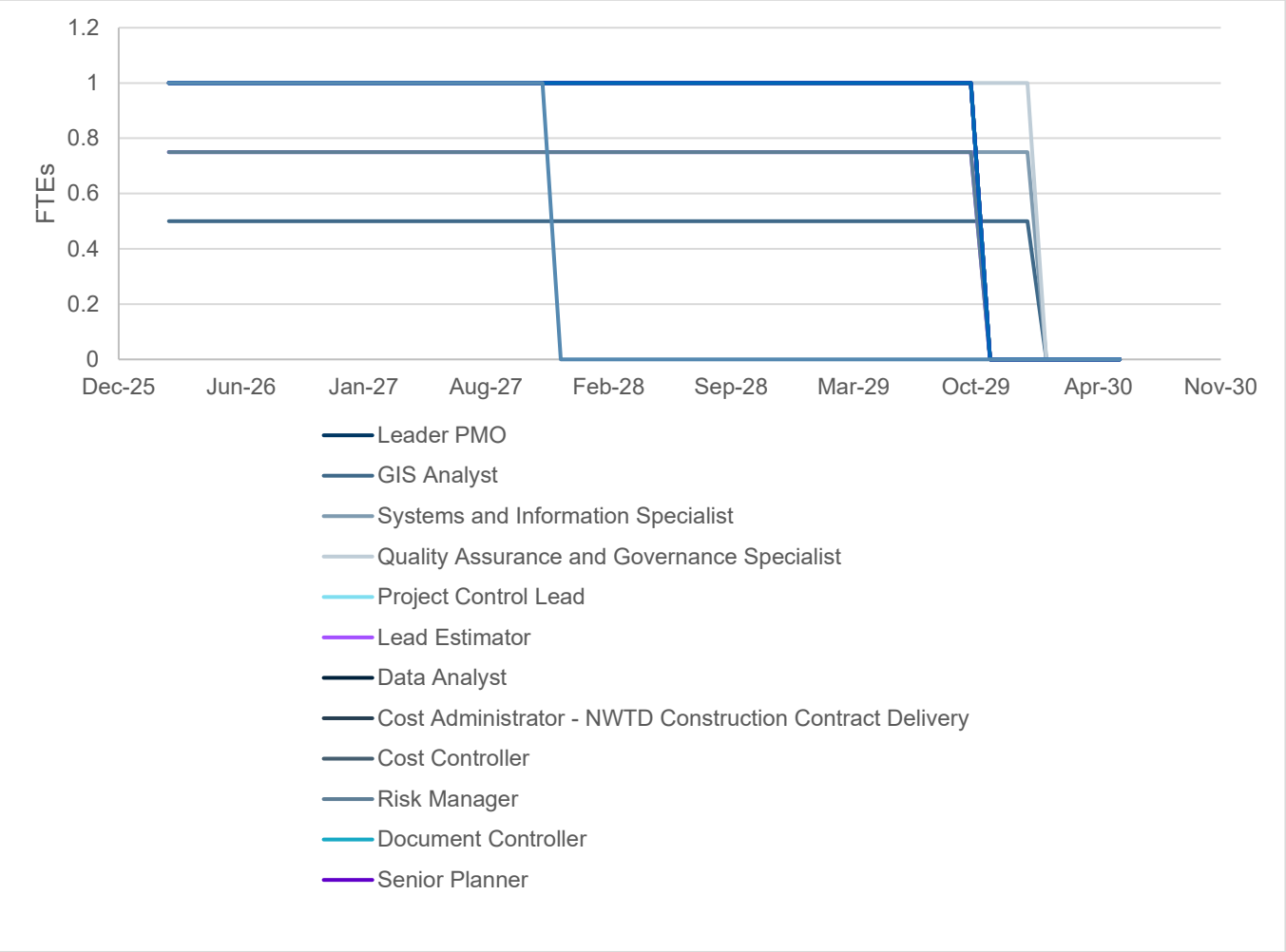

Figure 9 Project management phased FTE profile

The project management labour costs were benchmarked against similar transmission projects in Australia. The results are presented in the following table.

The NWTD CPA-2 project management costs represent 2.2% of the total capital forecast. This broadly aligns with the other projects benchmarked. The percentage of costs is higher than Project EnergyConnect and HumeLink CPA-2. However, both of these projects were significantly higher in total capital forecast with the majority of these costs associated with the direct capex and contractor costs.

Based on the benchmarking, the NWTD CPA-2 costs are considered consistent with other similar projects.

Table 33 Project management labour cost benchmarking ($M, various)

Project	Capital forecast $M	Project management labour costs $M	Percentage of capital forecast
QNI	222.8	5.9	2.6%
CWO enabling works (Transgrid scope only)	437.9	11.3	2.6%
VNI West Early Works CPA-1	1,096.3	23.7	2.2%
NWTD CPA 2	**978.1**	**21.6**	**2.2%**
Project EnergyConnect CPA-2	2,271	22.1	0.9%

Project	Capital forecast $M	Project management labour costs $M	Percentage of capital forecast
HumeLink CPA-2	4,279.1	3.7	0.1%

9.7.2 Indirect costs

The forecast indirect project execution costs to June 2030 of $26.6M includes costs related to overhead costs, project insurance, Principal's representative, vehicles and vehicle related costs, travel costs, training, and project management systems and software purchase.

Table 34 Community and stakeholder engagement indirect costs ($M, June 2024)

Description	GHD verification	$M
Overhead costs	[redacted]	[redacted]
Insurance	[redacted] to provide construction phase insurance over the EPC contract, marine transit and third-party construction liability. As final project information was not available, cost estimate was based on similar projects and provided in a low and high range. The cost claimed includes statutory charges but excludes GST. [redacted] cost estimate of [redacted] covering only the construction phase was sighted.	[redacted]
Principal's representative	[redacted]	[redacted]
Vehicle and vehicle related costs	[redacted] for vehicle hire across the duration of the project. Forecast based on internal cost estimate based on: – Number of roles which require vehicle use – FTE months per role – [redacted]/day vehicle hire rate – [redacted] – 120L in fuel use per week – [redacted] vehicle wash per week.	[redacted]

Description	GHD verification	$M
	Internal cost estimate provided and agreed to forecast. Assumptions applied in forecast considered reasonable.	
Accommodation and travel for interstate employees	[redacted] for employees located outside of Tasmania to be based in Tasmania for the duration of the project and travel from Hobart to Forecast based on internal cost estimate based on: – Interstate employee roles required to be based in Tasmania for the duration of the project – FTE months across the duration of the project – Accommodation costs of [redacted] per month per FTE [redacted] – [redacted] – Cost of [redacted] return per trip. Internal cost estimate provided and agreed to forecast. Assumptions applied in forecast considered reasonable.	[redacted]
Systems and software	[redacted] for software subscriptions for InEight, Borealis, Primavera P6 and BlueBeam. These software are industry recognised/standard software for construction project management, stakeholder management, and project scheduling. Quotes sighted for all software subscriptions and agreed to forecast.	[redacted]
Intrastate accommodation	[redacted] for employees based in Tasmania to conduct intrastate travel as part of attending site. Forecast based on internal cost estimate based on: – Number of employees per workstream (i.e. Project Execution, Project Management, etc.) – Estimated site visits per employee – Estimated accommodation costs of [redacted] per night – Per Diem of [redacted]/day – Per Diem payment frequency of 60% to account for site visits that do not result in a full day spent on site. Internal cost estimate provided and agreed to forecast. Assumptions applied in forecast considered reasonable.	[redacted]
Internal FTE training	[redacted] for internal FTE training. This includes [redacted] per FTE per year training allowance and four places in an Advanced Diploma course. The Advanced Diploma course is related to Power Systems engineering and considered prudent. Advanced Diploma course fees sighted, and FTE training allowance profile agreed to forecast.	[redacted]
Various <1M	Other costs individually < $1M	[redacted]
Total		**26.6**

9.8 Labour and indirect cost conclusion

Labour and indirect costs represent the incremental costs required to undertake the construction and delivery works of Stage 1 of the NWTD. The costs include:

– Incremental labour roles from September 2025 to February 2026 that were not included in the Early Works CPA-1

– Forecast labour and indirect costs from March 2026 to June 2030.

The forecasted labour costs have been estimated based on:

– The FTE profile and numbers required to deliver each project objective to support delivery, considered reasonable to deliver the project
– The month-by-month FTE requirements for each role type to meet the project schedule, with the composition of teams considered appropriate to deliver project stream objectives
– Labour rates for each role type, including on-costs such as superannuation, long service leave, etc, which have been benchmarked against comparable Australian transmission projects and found to fall below the averages rates applied to similar project workstreams.

Other indirect costs included are supported by third party quotes / estimates or allowances for a CSBP at 1% of total forecast cost. Based upon other projects of comparable size this allowance is within 20% of benchmarks.

10. Application of the capital expenditure sharing scheme

In its Final Determination on TasNetworks' 2024-29 regulatory proposal, the AER stated that it would consider the application of the CESS to the NWTD as part of the CPA process. The application of the CESS is considered outside of GHD's scope.

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