Transgrid

People. Power. Possibilities.

Deliverability Plan

2024-29 Revenue Proposal Waratah Super Battery Project (non-contestable)

30 June 2023

Contents

1. Abbreviations

Abbreviations used in this document are tabled below.

Table 1: Abbreviations

Abbreviation	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ALARP	As Low As Reasonably Practicable
BAU	Business As Usual
CSR	Concept Scoping Report
D&C	Design and Construct
DG	Decision Gate
ECI	Early Contractor Involvement
EII	Electricity Infrastructure Investment Act 2020 (NSW)
EPC	Engineering, Procurement and Construction
FEL	Front End Loading
GM	General Manager
ICT	Information Communication Technology
ISP	Integrated System Plan
LLE	Long Lead Time Equipment
LTI	Lost Time Injury
NER	National Electricity Rules
ODP	Optimum Development Path
OFS	Option Feasibility Study
PDM	Project Delivery Manual
PEC	Project EnergyConnect
PEP	Project Execution Plan
PDM	Project Delivery Manual
PGA	Project Governance and Assurance
PMBOK	Project Management Body of Knowledge
PTT	Powering Tomorrow Together
QNI	Queensland – New South Wales Interconnector
TNSP	Transmission Network Service Providers
REZ	Renewable Energy Zones
VNI	Victoria – New South Wales Interconnector
WSB	Waratah Super Battery

2. Executive Summary

The WSB project is being delivered at the same time as our program of BAU projects and our workstream of contingent and actionable major projects. We recognise that success in delivering the WSB project is dependent on co-ordination and optimisation with the additional workstreams due to pressures from the domestic and international markets competing for equipment, materials and resources.

We have assessed the deliverability risk of the WSB project and summarised the key elements of this plan that safeguard and de-risk deliverability in this challenging environment, including:

- **Resourcing risk** mitigated by:
    - **A new operating structure to mitigate deliverability risks** – we now have two separate delivery units (Delivery Business Unit and Major Projects Business Unit), each with their own separate sourcing strategies, capital planning, resourcing processes and contractor pools (Sections 5 and 6). In addition to this, within Delivery we have established a specific group and GM of Projects to manage our Class B projects (Section 8).
    - **A proven project management methodology and capability** – Even before the new operating structure was put in place, we delivered several large projects of similar scale to the WSB project (including Queensland-NSW Interconnector (QNI) Minor and Victoria-NSW Interconnector (VNI) Minor projects, Powering Sydney's Future and Stockdill) on top of our BAU workstream, on time and in line with the overall budget (Sections 7 and 10). This demonstrates that, even if additional projects eventuate, we have scalable systems, processes and capacity to deliver these.
    - **WSB resourcing strategy** – we have developed a resource strategy for the WSB project, including a establishing a dedicated WSB project team, internal resource forecasts based on a detail project schedule and a procurement strategy for external resourcing arrangements (Section 8).
    - **Contracting strategies to overcome supply constraints** – we have mitigating deliverability risk for WSB by running an Early Contractor Involvement procurement process to assist in rapid ramp up of contractor design and construction resources by involving the contractor in the development of the concept designs. We have taken actions to achieve an equitable risk allocation that contractors are willing to accept and have selected a preferred tenderer for the contracted works.
- **Equipment and material supply chain risk** mitigated by:
    - **Directly procuring key equipment** – we have leveraged our existing equipment panels to procure long lead equipment which we will then free issue to the contractor, meaning that orders are being placed early and ahead of awarding the design and construction contract.
    - **Early Contractor Involvement** – this procurement process means that the selected contractor, having developed the concept design ahead of contract award, is aware of the materials they require and can place orders for these as early as possible after contract award.
- **Strong governance** – our projects are subject to robust audits and multiple points of delivery accountability (Sections 9 and 10.2).
- **Operational readiness** – our systems and processes under our ISO55001 certified Asset Management System (AMS) and Electricity Network Safety Management System will ensure the WSB project assets seamlessly transition from construction to the operations and maintenance phase post commissioning (Section 11).

Our deliverability risk assessment shows that the above mitigations will enable us to secure the resource and supply requirements to deliver the WSB project on time and within budget, and seamlessly transition to the operations and maintenance phase. Given our many years of experience and well-established processes, backed by appropriate levels of planning and preparation and the internal and external

resources we have already secured for WSB project, we believe we are well positioned to mitigate and optimise deliverability.

3. Purpose and Scope

We recognise that the delivery of the WSB project will be undertaken at the same time that we are delivering AEMO's ISP Projects, including Project EnergyConnect (PEC), HumeLink and VNI West as well as our increasing BAU work program approved by the AER in its 2023-28 Revenue Determination.

This document explains how we propose to manage and deliver the WSB project (i.e., forecast capex and opex) as well as ISP Projects and our BAU capital program in a safe, reliable and efficient manner.

This document outlines our:

- Response to the challenges of our changing operating environment
- Operating model and objectives in response to the changing operating environment
- Two separate delivery programs: Major Projects and BAU Delivery
- Past capital program delivery performance
- Project delivery and resourcing strategy to source physical resources (i.e., labour and materials)
- Capital planning processes
- Project management methodology
- Operating and maintenance approach and resourcing
- Deliverability risk assessment, including resource requirements, risks and mitigations.

4. Response to the Changing Operating Environment

The WSB project will be executed at the same time as other NSW EII, contingent and actionable major projects. These infrastructure projects are the result of AEMO and the NSW Government making once-in-a-generation investments to build the transmission needed to support Australia's energy transition. We will also deliver our BAU capital program to maintain the safety, security and reliability of the existing network.

The electricity system is transitioning away from coal and towards renewables at an accelerating rate – even faster than had been previously planned for. As the pace of the energy transition accelerates, the next 5–10 years is shaping up to be a period of significant transformation for the NSW power system, driven by:

- The retirement of ageing coal generators
- A significant increase in renewable generation and energy storage as coal retires – supported by investment in transmission infrastructure which is needed to facilitate the energy transition, and
- Changes in energy demand and usage patterns as a result of greater electrification, new green industries and increasing distributed energy resources.

The announcement that the Eraring Power Station will close from August 2025 (seven years earlier than expected) highlights the potential for rapid changes and the importance of forward planning. We have quickly responded to the needs of our stakeholders to develop and deliver the critical WSB project to ensure continued reliable, secure, sustainable and safe supply of electricity in NSW following the anticipated closure of the Eraring Power Station in 2025.

AEMO's 2022 Integrated System Plan (ISP) highlights that the investment in new transmission required to transition Australia to a renewable energy-based power system needs to begin 'as urgently as possible'. Our strategy, aligned with AEMO's roadmap, is to create a network capable of connecting geographically and technologically diverse, low-cost generation to deliver renewable energy to customers. We therefore need to act quickly to:

- Strengthen the transmission backbone
- Support the connection of new generation and storage capacity, including Renewable Energy Zones
- Deliver essential system security capabilities, assets and services.

We are acting to bring forward delivery schedules and drive innovation at pace through our Powering Tomorrow Together (PTT) program. PTT seeks to de-risk the highly competitive supply chain as energy companies race to secure critical, large-scale equipment, materials and skilled people to deliver the projects, which will reshape the nation's grid. This includes procurement of:

- shunt reactors
- transformers
- conductor, and
- steel

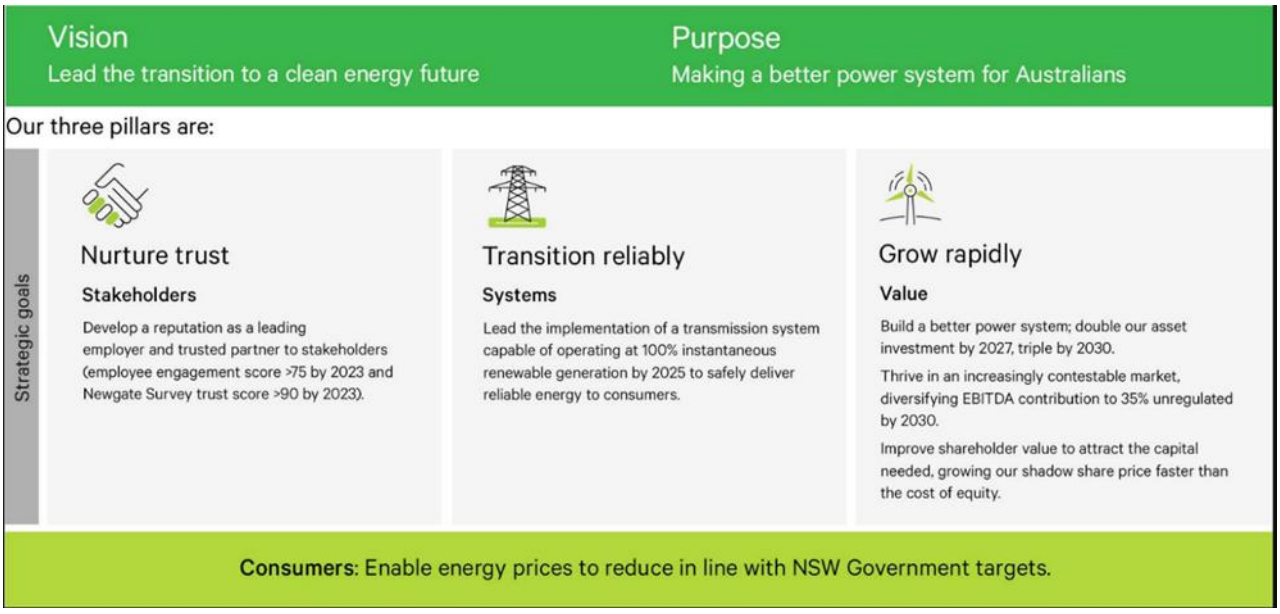
which will deliver the energy transition in the best interests of consumers (i.e., faster and cheaper), while also continuing to maintain a safe, secure and reliable electricity supply.

5. New Operating Model

5.1. Our Strategy and Operating Model

We are facilitating the transition to decarbonisation (NSW EII, contingent and actionable projects) while maintaining the reliability and safety of our existing transmission assets (BAU program). Our three strategic pillars to achieve this vision are described in Figure 1.

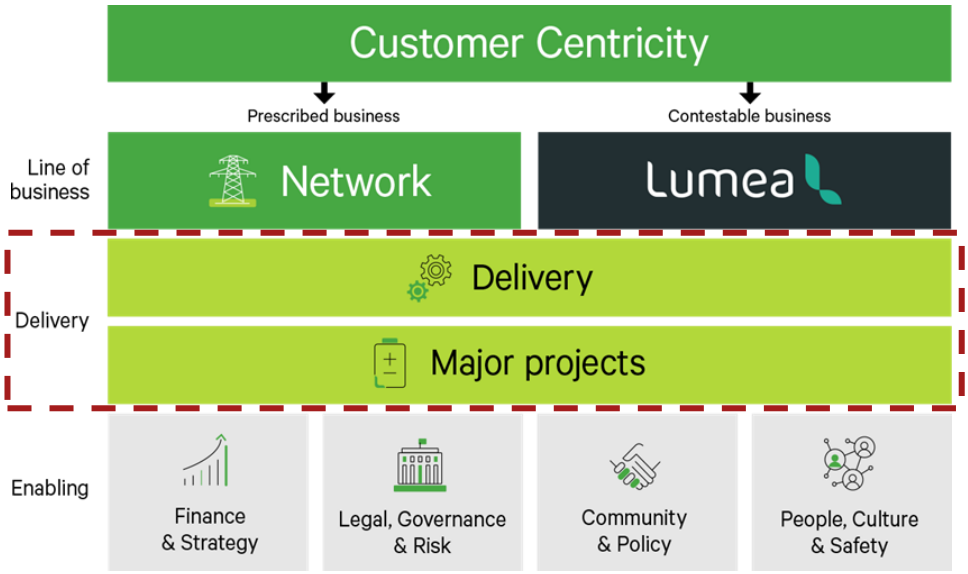
Figure 1: Our three strategic pillars



To successfully deliver both workstreams in the changing operating environment, we have restructured the business and implemented a new operating model with two separate and co-ordinated delivery functions (Figure 2) to mitigate and optimise deliverability:

- **Delivery** – focused on BAU project delivery and asset maintenance
- **Major Projects** – focused on projects identified in AEMO's ISP

Figure 2: Our operating model



5.2. Our Capital Program Objectives

Our capital program focuses on achieving our business vision and aligns with our strategic pillars. This alignment is set out through the asset management objectives and performance indicators (Table 2) in our Network Asset Strategy document.

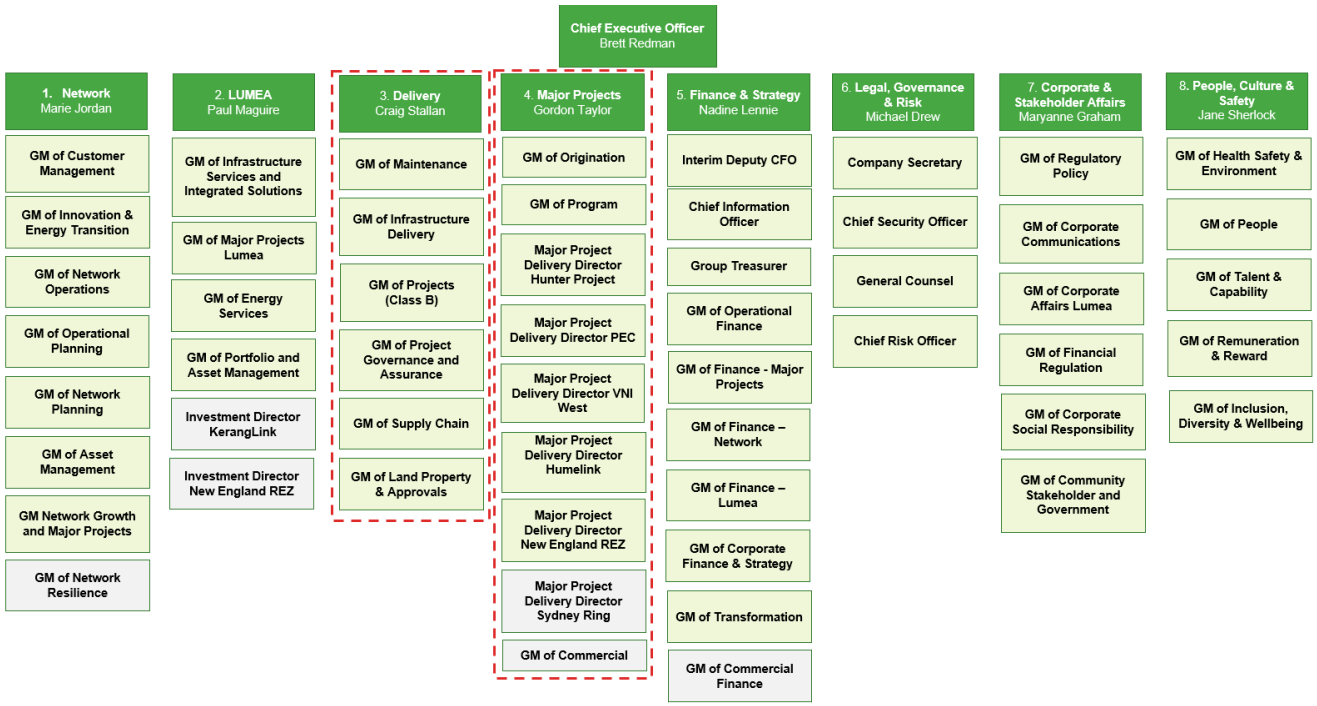
Table 2: Capital program objectives

Strategic Pillar	Asset Management Objective	Performance indicators
Nurture trust	• Manage assets efficiently to deliver security holder and consumer value • Develop standing as industry leader for regulatory reform	• Incorporate new network connected technologies into the Asset Management System • Meet Asset Management Program of Work budget targets • Meet agreed capital works budget target
Transition reliably	• Maintain network safety risk • Maintain network reliability • Support sustainable growth of the asset base by developing the right infrastructure	• Maintain Network Safety LTIs at zero • Maintain 5-year average of high potential (loss of control) incidents • Zero major non-compliances for all Network Management Systems • Meet reliability planning standard • Value identified for preferred network to support the energy transition
Grow rapidly	• Support sustainable growth of the asset base by developing the right infrastructure • Ensure asset information is available to inform business wide decisions	• Meet Asset Management Program of Work budget targets • Meet agreed capital works budget target • Meet STPIS performance targets • Value identified for preferred network to support the energy transition

6. Two Separate Delivery Programs

Our new operating structure mitigates and optimises deliverability by establishing two separate delivery units – each with their own Executive General Manager (Figure 3) sourcing strategies, capital planning and delivery (resourcing and contractor pools) processes.

Figure 3: Our organisational structure



6.1. Major Projects Business Unit

6.1.1. Major Project Program

The Major Projects Business Unit focuses on managing the delivery of ISP projects, which are at various stages of delivery and development. Current projects include:

- EnergyConnect
- HumeLink
- VNI West

These projects will interconnect renewable generation across the states to ensure a more reliable and renewable Australian network. The Major Projects Business Unit has an opportunity to deliver efficiencies and benefits of scale across these ISP projects by integrating their construction into a single simultaneous program, known as PTT. The PTT program will:

- Provide certainty for system planners and the developers of renewable electricity and storage
- Facilitate investment at scale in local production of materials and assembly
- Allow materials (i.e., shunt reactors, transformers, conductor and steel) to be purchased earlier and at a lower cost

- Offer significant scale, enabling limited construction resources to be secured against consistent demand
- Increase the confidence and retention of contractors by providing consistent work

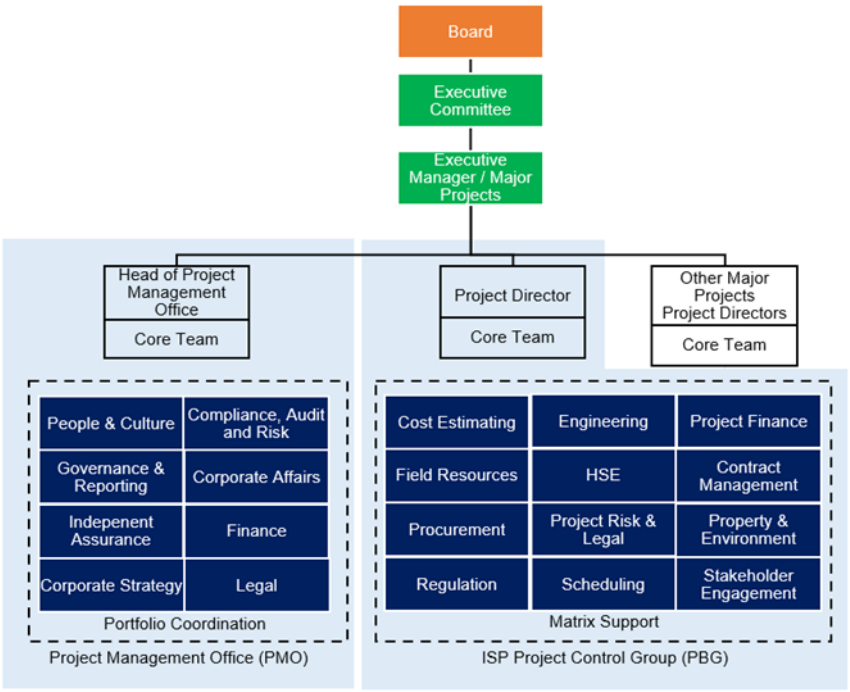
6.1.2. Major Projects Group Structure

Major Projects delivery is led by its own Executive General Manager, with each project appointed and led by a Project Director who is responsible for:

- Safe delivery of the project works
- The entire project life cycle through development and execution
- Project approvals, including planning and environmental permits
- Procurement and sourcing
- Managing and coordinating risk, and stakeholder and community engagement

Each Project Director is supported by a dedicated project team (Figure 4).

Figure 4: Major Projects Group structure



6.1.3. Major Projects Sourcing Strategy

The sourcing strategy for each major project is developed as the project progresses through early project planning (Figure 5). The strategy selected is governed by risk assessment, including assessing issues such as procurement and integration risks. Sourcing strategy options include EPC, Alliance or D&C delivery.

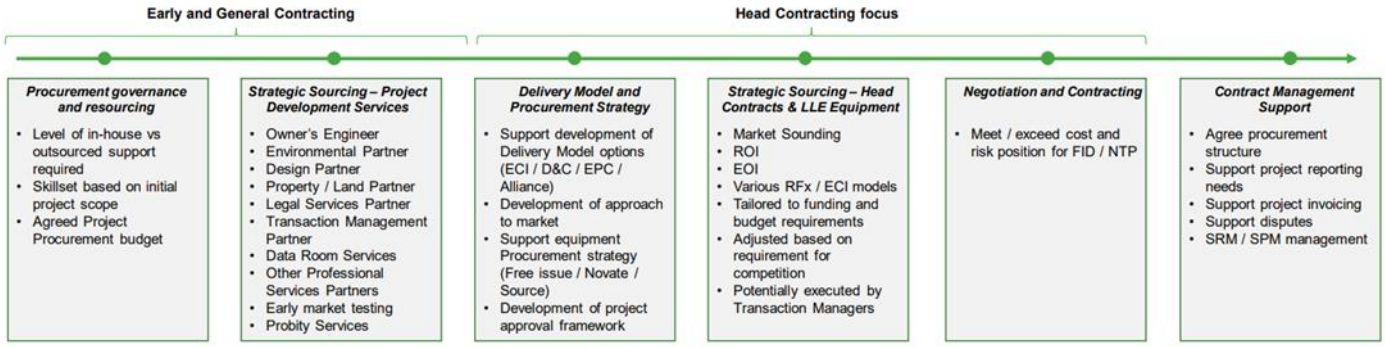
The contractors involved in delivering ISP major projects are typically major local and international contractors and consortiums who specialise in delivering projects of this size, scale and complexity. These are a different tier of contractor to those involved in BAU capital program delivery. Our ISP contractors typically have access to pools of international resources and expertise they can draw on to resource these projects.

Transgrid mitigates capacity risk by using these specialised contractors and also using ECI to identify preferred contractors based on their competency and capacity. Capacity is assessed during these early engagement phases and again during tender evaluation.

Our Project Management Methodologies and Project Implementation Plan set out the requirements for developing sourcing strategies and appropriate procurement processes. Selecting a preferred contractor occurs in accordance with a Board-approved formal tender evaluation plan. The evaluation process covers competency and capability to manage delivery capacity risk.

Major projects are also supported by various professional services contractors as required throughout the project lifecycle. This external project delivery expertise is sourced and scaled to the needs of the major project.

Figure 5: Major project procurement requirements



6.2. Delivery Business Unit

6.2.1. Delivery Program

Our Delivery Business Unit is responsible for executing our BAU construction programs, projects and maintenance work. Procurement & Supply Chain and Land & Property Management also fall under the Delivery umbrella which assists in the co-ordination and optimisation across both programs. This business unit contains all of the operational capabilities required to execute large projects, BAU projects and maintenance activities, including project development, procurement, construction, and commissioning for:

- **Large projects** – Significant network augmentation projects which are larger than BAU projects but are not the scale of major projects
- **Augex projects** – BAU demand driven, compliance and economic benefits projects
- **Repex projects and programs** – transmission lines, substations and digital infrastructure
- **Non-network property and fleet**

Delivery also manages ongoing maintenance programs for the assets once commissioned.

6.2.2. Delivery Group Structure

Delivery is led by its own Executive General Manager, with General Managers leading each functional stream (Figure 3), including:

- **Infrastructure Delivery** – delivering Augex and Repex BAU projects from concept design, led by a manager of projects with a team of shared resources.

- **Projects (Class B)** – delivering Class B projects from concept designs to commissioning. Each led by a Project Director supported by a dedicated project team.
- **Project Governance & Assurance** – driving improvements across Delivery in conjunction with key delivery partners
- **Maintenance** – maintaining our assets and delivering an efficient and predictive program
- **Land and property** – managing our land and property assets
- **Supply chain** – providing end-to-end services to support delivery teams, including procurement, fleet, warehouse and logistics

6.2.3. Delivery Sourcing Strategy

Our BAU delivery currently has commercial panels for procuring network equipment, as well as outsourcing trades and professional labour and resources. These panels allow us to procure:

- Network equipment and free issue to contractors at better leveraged terms due to our collective buying and bargaining power
- Services and resources, both professional and trades labour, to address the fluctuations in program resourcing requirements.

These panel sourcing arrangements are described in Section 8.3.

Our sourcing strategy enables us to respond quickly to changes in work volumes, leveraging the expertise and capacity of our partners. Our long-term relationships with our suppliers and delivery partners allow us to mitigate market volatility risk.

7. Proven Delivery Performance

In the current regulatory period, before putting our new organisational structure in place, Transgrid successfully delivered a number of significant projects, including:

- Powering Sydney's Future
- Stockdill substation
- QNI minor upgrade
- VNI minor upgrade

These were in addition to our BAU program and additional maintenance works in the aftermath of unprecedented extreme natural hazard events, such as the 2019-20 bushfires, that damaged our assets requiring extensive repairs. They were delivered on time and within budget.

Even with our previous operating model, our robust internal processes and sourcing arrangements allowed us to successfully scale up to deliver increasing work volumes as they occurred. **This demonstrates Transgrid's capability to deliver large projects as they arise on time and within budget. Even if additional NSW EII or NER Contingent Projects were to eventuate, we have capacity to deliver them over and above our current works programs.**

We have a steady program of BAU asset replacements that we undertake over time as we continue to maintain a safe, secure and reliable network over time. We have well established processes in place that to continue delivering our BAU asset replacements into the future.

In contrast, our delivery volume for network augmentation work has changed with time as we respond to developments affecting the network to meet the needs of our customers. In recent years we ramped up to successfully deliver the Powering Sydney's Future project, as well as AEMO's Actionable ISP contingent projects that have arisen, on-time and on-budget (Figure 6).

Table 3: Major projects delivered in 2018-23 ($Million, Real 2022-23)

Project	AER Determination allowance	Actual costs	Difference
Powering Sydney's Future	273.2	236.3	-36.9
QNI Minor upgrade	252.9	254.1	1.2
VNI Minor upgrade	52.3	46.4	-5.9

Our successful delivery performance, despite the lumpy nature of network augmentation projects, is made possible by the resourcing and contracting strategies we have put in place to deliver these projects. For these projects, we typically rely on our delivery partners to provide detailed design and construction services and resources, with our internal resources providing oversight and governance for the various elements of the project. We are also able to supplement our internal resources with professional services contractors as required.

Figure 6: Augex actual / estimates for previous and current regulatory period ($Million, Real 2022-23)

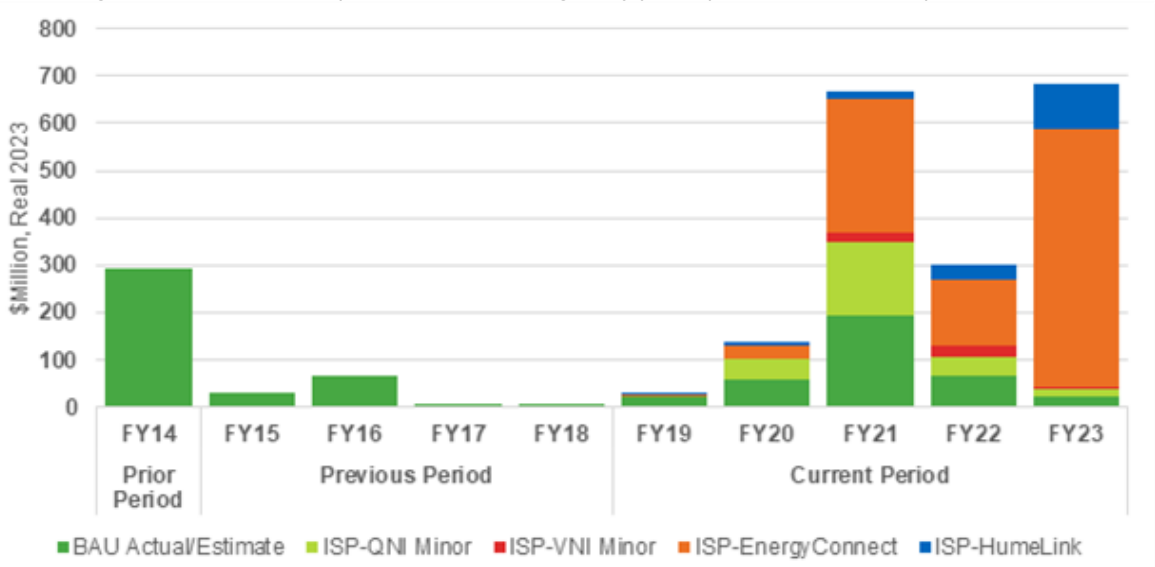


Figure 6 also shows AEMO's Actionable ISP projects we have delivered or are delivering. These include QNI minor upgrade, VNI minor upgrade, PEC and HumeLink early works, which the AER approved through the contingent projects process during the 2018- 23 regulatory period. **This demonstrates our ability to deliver ISP projects and any contingent projects or NSW EII projects which may arise in addition to our BAU Capex using our operating model and major projects sourcing strategy.**

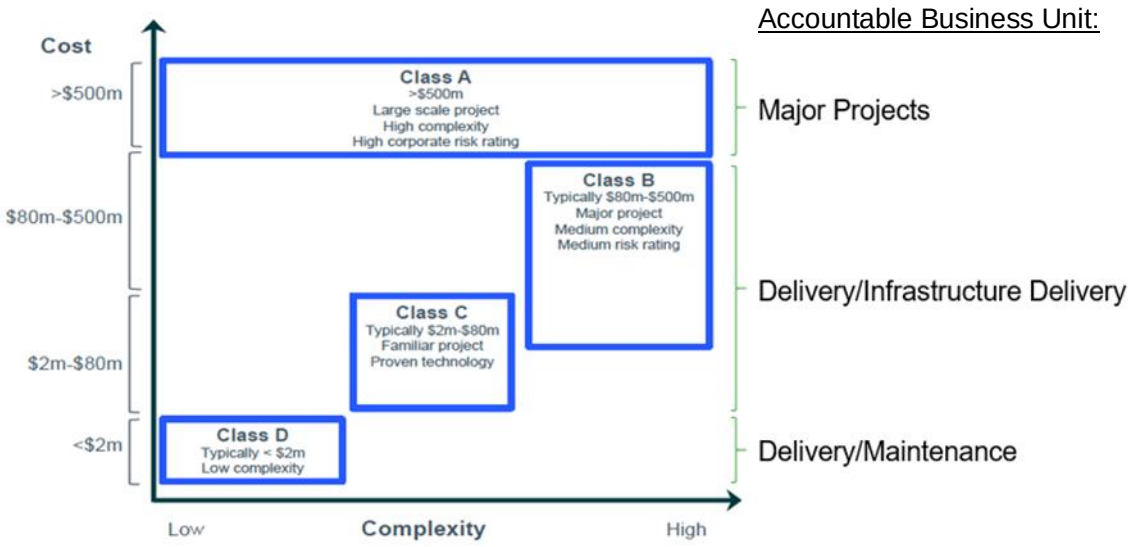
8. WSB Project Delivery and Resourcing Strategy

The following sections set out how Transgrid delivers our capital investment, planning and program delivery processes. It also provides an overview of capital program delivery structures, project management methodologies, delivery resources, sourcing strategies, delivery risks and mitigation strategies that we are applying to the WSB project.

8.1. Our Service Model

Our operating model (described in Section 5) has established two service lines, our Major Projects Business Unit and our Delivery Business Unit (each described in Section 6). Each project is classified to determine which Business Unit is accountable for the project delivery (Figure 7).

Figure 7: Project classifications



Each Business Unit and, in the case of Delivery, each General Manager, has dedicated internal resources who manage the delivery and sourcing strategy for project implementation and construction. Typical resourcing models for each class of project are:

- **Class A** – Internal dedicated project team supported by professional services contractors and large national/international delivery contractors (refer to Section 6.1)
- **Class B** – Internal dedicated project team supported by internal functional resources, professional services contractors, and tier 1 delivery contractors
- **Class C** – Internal functional project resources supported by professional services contractors and tier 1, 2 and 3 delivery contractors
- **Class D** – Internal delivery or functional project resources supported by professional services contractors and tier 2 or 3 delivery contractors.

The classification also denotes a project's:

- Minimum project management deliverables that must be prepared by the project team
- Governance structure
- Assurance requirements

These requirements are set out in Table 4.

Table 4: Governance, assurance & deliverables expectations

Class	Governance	Assurance	Deliverables
A	• Accountable Executive supported by a Decision Board • Define in a Governance & Assurance Plan	• All gates mandatory • Define in a Governance & Assurance Plan • Gate Reviews chaired by PGA Manager	• Core range of deliverables + optional deliverables as agreed with PGA Manager
B	• Accountable Executive supported by a Decision Board • Define in a Governance & Assurance Plan	• All gates recommended, PGA with Accountable Executive to decide. • Define in a Governance & Assurance Plan • Gate Reviews chaired by PGA Manager, peers or other independent lead	• Core range of deliverables, some tailoring and optional deliverables depending on project complexity and risk areas
C	• Relevant Asset Line Manager • Define within PEP	• All gates suggested – PGA to decide • Gate Reviews chaired by peers	• Scaled back deliverables
D	• Relevant Line Manager	• Scale back Gating; fit for purpose to project	• Minimum deliverables (PEP, Risk, Cost, Schedule)

The WSB project is considered to be a Class B project and is therefore managed by our Delivery business unit with a dedicated Project Director and internal project team.

8.2. Internal Resourcing Arrangements

8.2.1. Project Delivery Responsibilities

Project specific roles and responsibilities are documented in the WSB Project Execution Plan (PEP) developed by the appointed Project Director and approved by the Project Sponsor. The PEP provides clarity on the specific roles and responsibilities for each project.

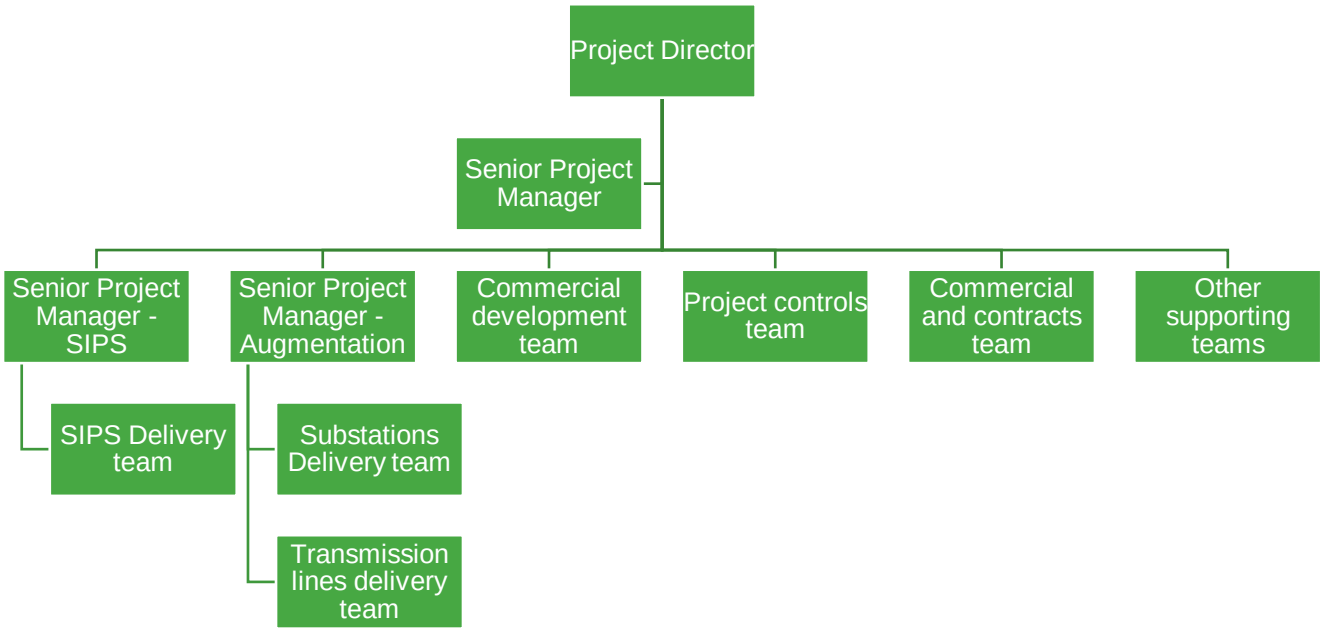
Guidance on responsibilities for key roles with respect to project delivery from concept to close-out are captured in our standard Levels of Authority Matrix and standard RACI, included in Appendix C.

8.2.2. WSB Project Delivery Structure

The GM Projects (Class B) is ultimately responsible for all Class B projects, which includes the WSB project. The GM has appointed a Project Director for the WSB project to lead the development and delivery of the project, with the Project Director establishing a project team with dedicated delivery resources.

The dedicated delivery team for the WSB project provides confidence that the project is adequately resourced to meet its delivery objectives and milestones. A summarised view of this project team structure is shown in Figure 8, with a detailed organisation chart shown in Appendix A.

Figure 8: WSB project delivery team structure



8.3. Resourcing strategy

Our WSB project delivery resourcing strategy relies on:

- internal resources for project management, procurement and assurance activities
- internal resources for the design and implementation of SIPS control, which will draw on our internal control, protection and automation design resources and our internal construction, testing and commissioning crews, and
- external resourcing arrangements for detailed design and construction activities though our panel arrangements for the augmentation works.

8.3.1. Internal Resource Forecast

We have forecast our internal resource requirements, as shown in Figure 9, to deliver the WSB project using a bottom up FTE build based on the project schedule (refer Appendix B), which has also been used to develop our labour and indirect cost forecast.

Figure 9: Internal WSB resource forecast

The FTE requirements for the core team delivery team remain relatively flat across the life of the project, however there are peaks during:

- augmentation works construction activities, which require site resources such as site managers to ramp up during these periods which are typically in the autumn and spring outages windows, and
- SIPS control implementation works, which require a ramp up in technicians to install, test and commissions SIPS control.

We are experienced in managing peaks in our FTE profiles for individual projects within our overall capex program. On recent projects such as Stockdill substation and Powering Sydney's Future projects, we successfully managed the increase in resource requirement by leveraging resources in other parts of our BAU program. For example, using maintenance staff as site managers on capital projects on a temporary basis and contracting maintenance work with a service provider. We will make similar arrangements for the WSB project to ensure internal resources are available and allocated to the project so that it meets the project objectives and milestones.

8.3.2. External Resourcing Arrangements

We will rely on our existing commercial panels for procuring standard equipment as well as outsourcing of trades and professional labour and resources. The suppliers on the panels are all signed up to agreed terms and conditions and represent companies that have worked with us before.

Out procurement strategy for WSB sets out how we will leverage external resources to deliver the project. The following panels play a key role in delivering and resourcing the WSB project:

- **Construction Services Panels**[1] – we have engaged a contractor from our construction services panel for the design and construction of the WSB project augmentation works. This allows us to cater for the step-up and step-down in resources required for the augmentation works.

[1] The construction services panel includes companies with design and construction capability, including design services. Contractors on this panel include tier 1 firms such as Downer, UGL, Zinfra, and CPP. These contractors have the capacity to undertake design and construction packages for Class B and Class C projects, including major greenfield and brownfield projects.

- **Network Equipment Panels** – we are purchasing and free issuing a range of equipment required for the WSB project, including transmission line insulators, substations HV equipment and various control and communications relays and equipment for SIPS control.
- **Professional and Technical Services Panels** – we will engage services from these panels to deliver specialist services such as environmental assessment and legal advice. We will also engage services from these panels to backfill internal FTEs engaged on the WSB project.

Our other panels which we may draw on are tabulated in Appendix D.

9. Capital Planning Process

9.1. Capital Investment Processes

Our established capital investment process adheres to the Asset Management Policy and Asset Management Objectives defined in our Network Asset Strategy, which is aligned with our business plan. The full details of the process are set out in our Prescribed Network Capital Investment Process.

The governance framework over the capital investment process incorporates our delegation of authority, defined accountabilities and responsibilities for project planning documents and project Decision Gates, including a range of appropriate governance roles and bodies.

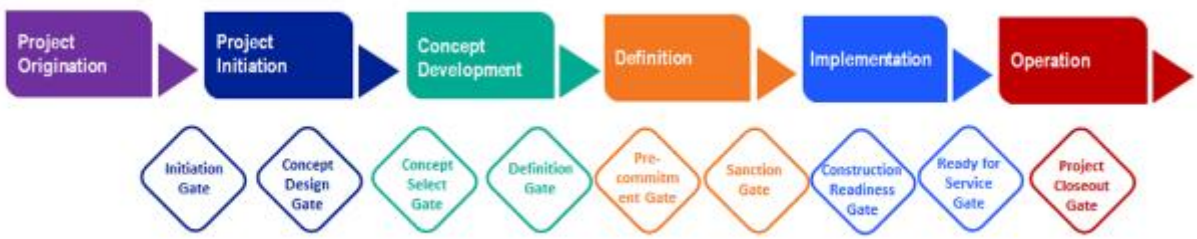
9.2. Project Phases and Gates

Potential investments are subject to DG review and approval, which incorporate the principles of FEL to ensure appropriate evaluation of options and value before significant spend is committed.

Appropriate documentation is required to support DG progression and key outputs that are used as inputs to the capital planning process. The documentation required to support decision making is set out in our Prescribed Network Capital Investment Process and Project Management Framework. Our network investments typically have DGs requiring approval from the delegate with appropriate Financial Authority, including at project commencement and project approval.

The project phases and gates are shown in Figure 10.

Figure 10: Project phases & gates



10. Project Management Methodology

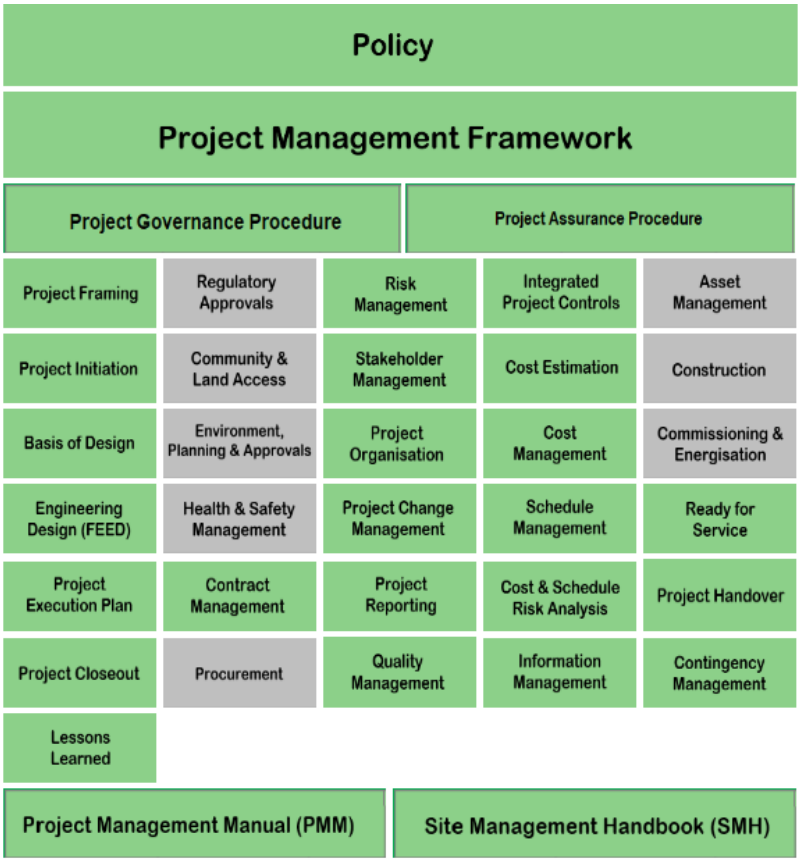
Transgrid's Project Management System Framework is broadly aligned with the Project Management Institute of America's PMBOK. The Framework gives us a scalable project management methodology that can adapt to a range of electricity transmission infrastructure projects, from small repeatable projects to major projects of significant complexity and risk.

Our Framework is based on the following principles:

- **Integrated and multidiscipline approach** – Asset development is complex and a multidiscipline approach is required covering all aspects (e.g., technical, community, risk).
- **Front End Loading (FEL)** – Sufficient time and resources are required in the early phases to maximise the project's potential return and value.
- **Assurance and governance** – Projects are responsible for undertaking assurance on their project and establishing governance structures to support effective project decision making.
- **Gated decision making** – Assurance reviews and formal decision gates ensure that a decision to proceed with a project is taken with a full understanding of the risks by the Accountable Executive.
- **Stakeholder management** – Projects actively engage sponsors and stakeholders, and plan for decisions.
- **Flexibility and scalability** – While there are minimum requirements, the content and depth of each activity is flexible and adapted to the specific project.

Figure 11 presents an overview of our project management framework.

Figure 11: Project management framework overview



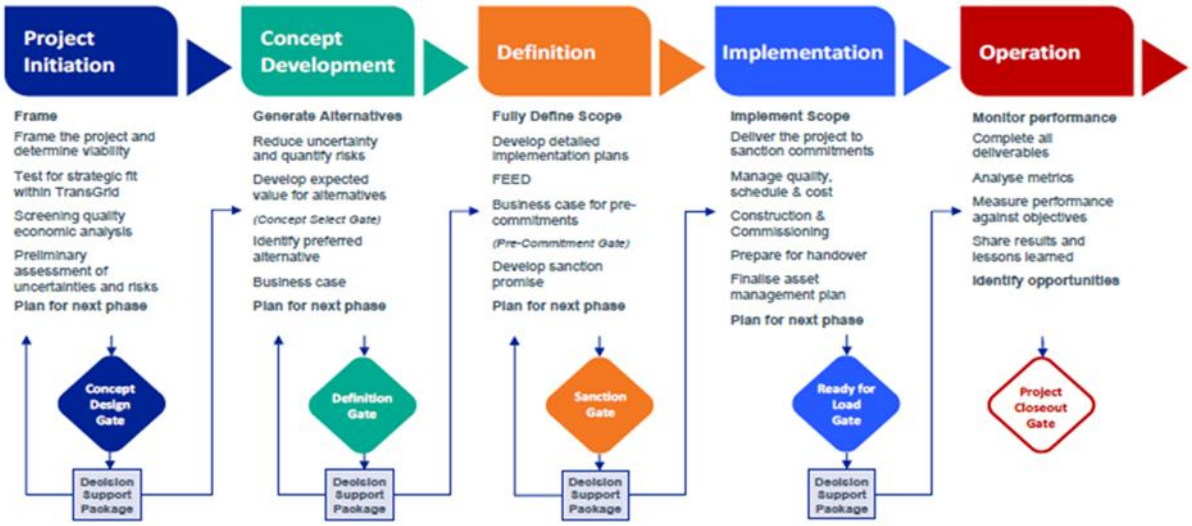
10.1. Project Phases

Each phase corresponds to a distinct stage in the project life cycle. Independent assurance reviews are required toward the end of each phase to ensure the project is ready to proceed.

The first two phases – Project Initiation and Concept Development – are concerned with identifying the project and determining its delivery value. Whereas, the subsequent three phases are focused on successful delivery (see Figure 12). Effective FEL ensures the project is properly framed and the optimum concept identified. At the end of project initiation, the project should be clearly framed, major risks and uncertainties identified, and the fundamental viability of the project determined.

Concept Development is a key phase for adding value to a project and is focused on assessing a range of alternative concepts and selecting the most appropriate concept which will maximise returns and minimise risks to Transgrid. At the end of Concept Development, a concept is selected for further study, the basis frozen and the scope closed. The Definition, Implementation and Operate phases are where the value is realised through detailed definition activities for the selected concept, followed by implementation and handover to operations. At the end of the Definition Phase a business case must be finalised, forming the basis for performance measurement.

Figure 12: Project phase activities



10.2. Project Governance

Our Project Management System Framework sets out the minimum requirements for governance. The governance of a project is the critical link between the executives responsible for determining and guiding the strategic direction of an organisation and those responsible for executing and supporting those strategies. Project governance refers to the management structures and the process for strategic project decision-making in relation to a particular project (refer Governance Procedure).

Project governance provides transparency and steering of the project team's activities to enable the:

- Sponsor to make quality decisions to ensure that business objectives are achieved
- Creation of clear boundaries and decision rights for the Project Manager and Project Team to progress through the project phase.

Typical Governance Structures can include the sponsor acting solely or supported using a Decision Board or Steering Committee.

10.2.1. Auditing & Compliance

Project auditing and monitoring of compliance of project management and capital delivery with our prescribed processes is the responsibility of the GM Project Governance and Assurance.

The project compliance auditing program provides feedback to the system's owners for continuous improvement of our systems and processes.

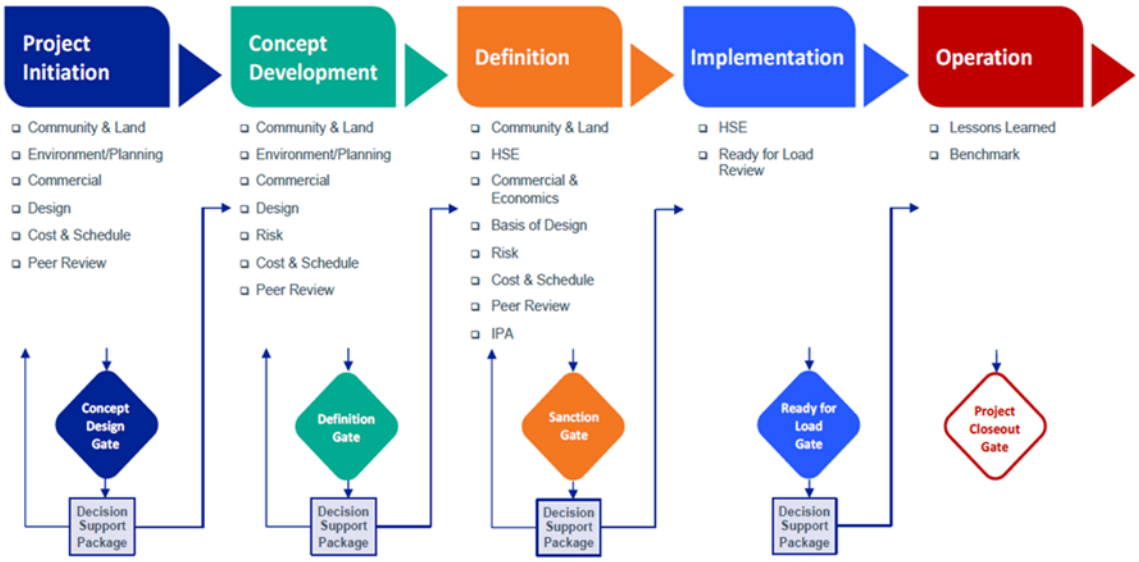
10.2.2. Authority Matrix

Our role authority limits and financial delegations, including for project management roles, are documented in our Financial Authorities procedure.

10.3. Project Assurance

Project Assurance is the process of identifying and performing appropriate, independent and impartial reviews to confirm the work is appropriate and complete to the right quality, and that the risks are known with appropriate controls in place. The assurance process helps to maximise the value of an investment, reduce uncertainty and risk, and ensure that regulatory and operational requirements are delivered. The process is based on a series of decision points where opportunities and risks are considered, with input from all key project stakeholders.

Figure 13: Typical project assurance coverage

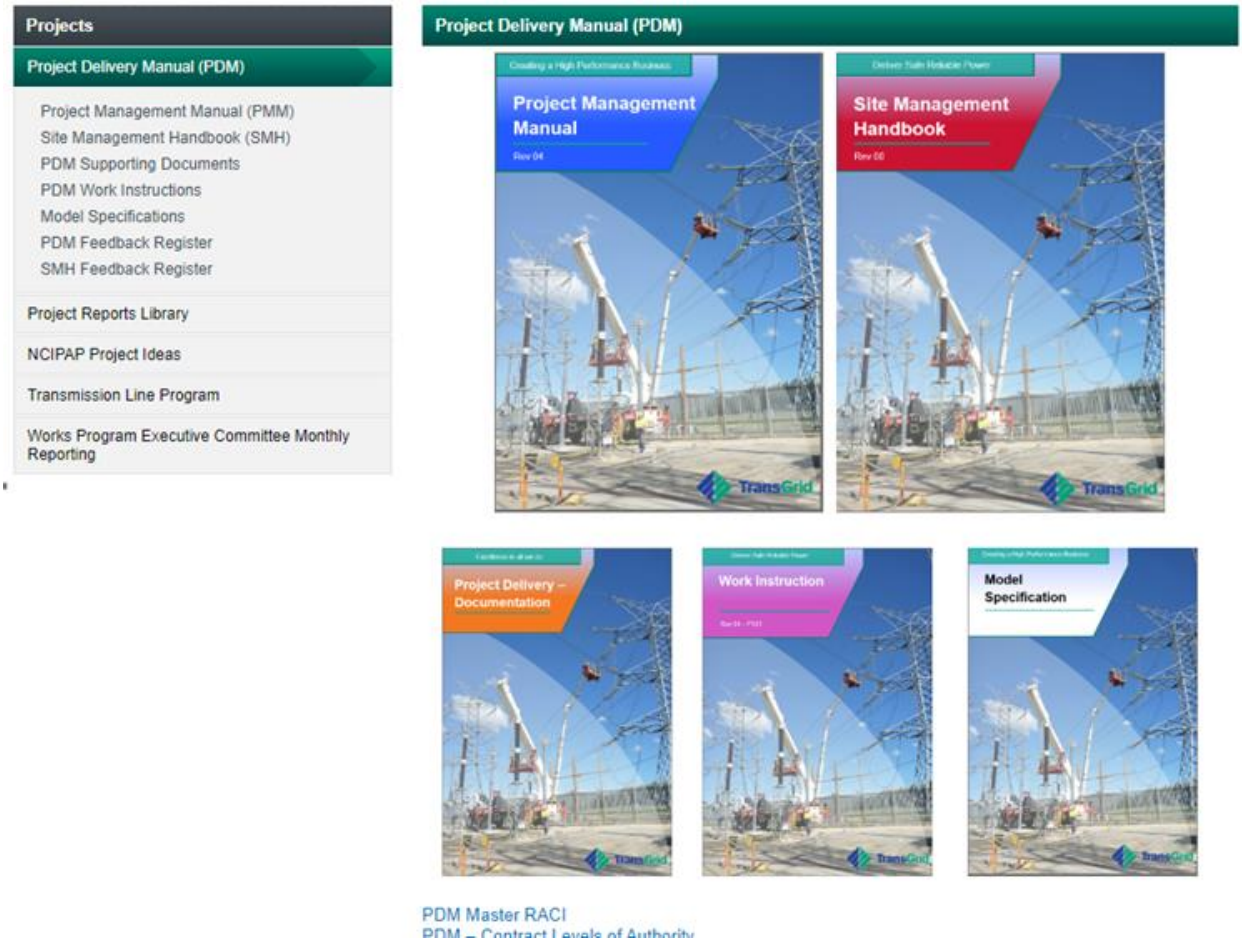


10.4. Project Systems

The PDM and associated systems and processes are used to provide the systems approach to project management of the Program for all Class B, C and D projects. The PDM is maintained and developed by the Manager of Projects and is aligned with the PMBOK project management methodology.

PDM documents are accessed through our intranet as shown in Figure 14.

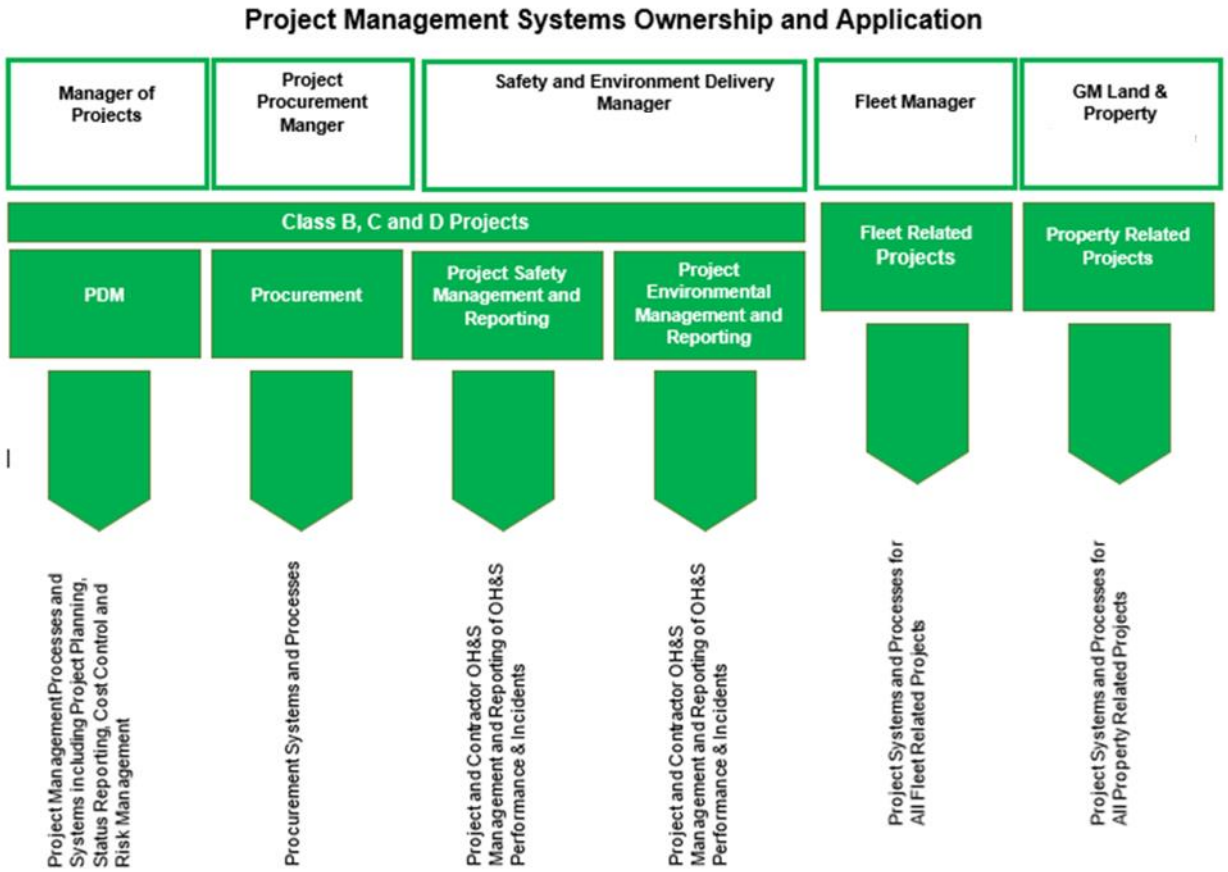
Figure 14: Project systems portal



The PDM is written around the project management and governance requirements for capital projects.

Figure 15 highlights the ownership and application of project management systems across the Program.

Figure 15: Project management systems ownership and application



10.5. Project Execution Planning

The progressive development of the PEP represents a key step in successful project planning. The PEP is the overarching project management document for the project, and its purpose is to detail, in increasing depth as the project develops, the strategy, tactics and plans for the Concept Development, Definition and Implementation phases of the project to meet the business requirements.

The PEP is a ‘live’ process for planning and executing a project, and integrating business goals as agreed with the sponsor. It defines roles and responsibilities of all parties involved in delivery, and documents decisions and plans that will determine the Project's path. Creation of the PEP promotes project ownership and single point accountability of the Project Manager. The PEP is updated when a material change in scope, cost or time is realised.

The PEP typically:

- Outlines the requirements of key stakeholders and states how those requirements will be met through project execution
- Explicitly states a defined and agreed Project Execution Strategy
- Addresses communications planning
- Outlines organisational structures, reporting lines, interfaces and responsibilities
- Outlines the management of design, procurement, fabrication, installation, construction, inspection, testing and pre-commissioning activities

- Outlines how the management of HSE, Quality, Human Resources (and Industrial Relations if applicable) is integrated into delivery
- Defines project documents and detailed sub plans (i.e., Quality Management Plan) to be developed to manage the specific project functions
- Identifies procedures and standards to be used by the Project Team to control the project
- Describes coordination, monitoring, auditing, inspection, reporting and review activities

10.6. Capital Project Delivery and Integration

Every project within the Program has a PEP approved per the Authority Matrix requirements in Section 10.2.2. The Project Management System Framework includes managing concurrent integrated functions, including:

- Scope management – including change management processes
- Risk management
- Safety
- Quality management
- Scheduling
- Cost estimation
- Cost management
- Commercial management
- Communications management and coordination

The PEP provides clarity on how all of the above are managed within the projects and the links and integration within the specific functions.

Importantly, the PEP articulates the project objectives, including project safety and environmental objectives, asset performance and handover timing objectives, as well as project cost objectives. As part of objective framing. the PEP makes clear the project KPIs, which must align with the Capital Program Objectives described in Section 5.2.

11. Operations and Maintenance

Following commissioning, the assets transition into the operations and maintenance phase of the asset lifecycle (refer Figure 10). Successful transition to operations and maintenance is captured under our ISO55001 certified Asset Management System (AMS)[2] and Electricity Network Safety Management System to manage network safety risks to SFAIRP and ALARP.

We have an Asset Acceptance procedure to ensure successful handover of the asset from the construction phase to operating and maintenance phase, which involves two key steps:

1. Pre-energisation approval – this is required Prior to energising an operational asset, with our network operations team requiring confirmation that newly provided equipment can be operated, maintained and responded to safely and reliably, and
2. Asset acceptance – formal confirmation is required by the Asset Manager stating that all aspects of asset integration have been completed such that the assets can be adequately maintained throughout their lifecycle.

The WSB project assets will also be incorporated into our Network Asset Strategy, Asset Renewal and Maintenance Strategies and Maintenance Plans.

As set out in our Revenue Proposal, our operating activities involve contract management, network planning, network operations and regulatory activities averaging 6.8 FTE across each year of the 2024-29 period. Key resources have already been engaged through the development and construction phase and continuing on through the operating phase of the WSB project, with resources being recruited for these roles and existing resource roles being backfilled with additional resources or making use of labour hire and our professional services panel. The activities will be led by the Networks business unit with support from other business units.

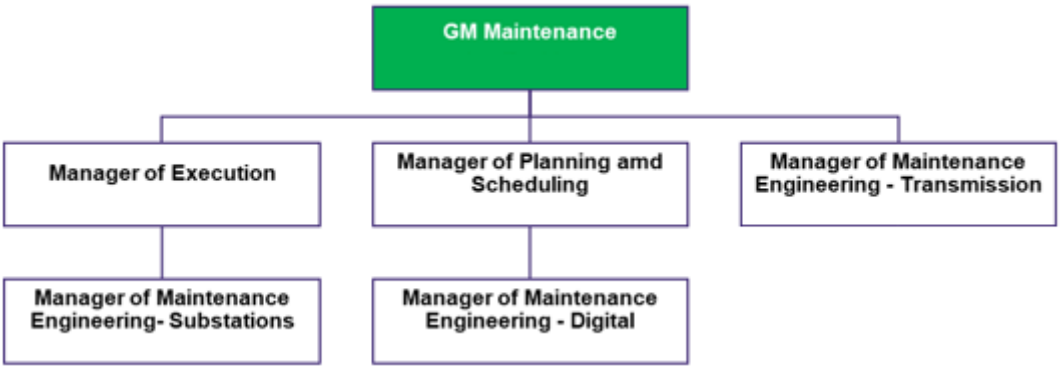
The maintenance activities will be added to the relevant asset class maintenance plans and resourced through our Delivery-Maintenance team. The GM of Maintenance is responsible for delivering all maintenance activities, which are managed, planned and executed by the Maintenance team shown in With appropriate planning and using our existing systems and processes we will be able to integrate the WSB project assets into our operations and maintenance regimes, with the appropriate resourcing arrangements to support this.

[2] As set out in our Asset Management Policy, Asset Management System Description and supporting documents.

Figure 16. The maintenance activities planned for the WSB project are consistent with other maintenance tasks we perform across our network and will be resourced using a mix of internal and contracted resources to optimise safe and efficient delivery.

With appropriate planning and using our existing systems and processes we will be able to integrate the WSB project assets into our operations and maintenance regimes, with the appropriate resourcing arrangements to support this.

Figure 16: Maintenance organisation structure



12. Deliverability Risk Assessment and Mitigation

12.1. WSB Project Delivery Risks and their Mitigation Strategy

Key deliverability risks and their controls are summarised in Table 5.

Table 5: Deliverability risks

Key Risks	Controls
Resourcing Risk, including competition for skills	• Deliverability Plan • Procurement strategy • Use of Construction Services Panel, ECI process and tender to engage contractor • Contracting strategy to achieve equitable allocation of risks (see below) • Internal resourcing for complex and critical elements, i.e., SIPS control
Equipment and material supply chain risk	• Use of key panels with early orders for equipment supply of long leads • Use of existing panel contractors with terms and conditions acceptable to Transgrid • Holding stocks in our warehouse • Early contractor involvement to identify equipment and material procurement requirements early
Commercial risks	• Use of existing panel contractors with terms and conditions acceptable to Transgrid • Early contractor involvement (refer below) • Contracting strategy to achieve equitable allocation of risks (see below)
Governance – Multiple Points of Delivery Accountability	• Auditing of Program delivery against Transgrid's own business processes • Steering committee reporting
Project Plan – on time and on budget	• Project reporting to Transgrid Executive and steering committee • Mature project control processes
Operational Readiness	• Asset Acceptance and Operational Readiness procedures
Operations and Maintenance – safe and reliable operation	• Asset Management System and Electricity Network Safety Management System • Network Asset Strategy • Operating procedures and manuals • Maintenance plans

12.2. Working With Contractors

Risk assignment through lump sum contracting has been common practice for works contracts where scopes of work are clearly articulated and understood, and execution is within the contractor's control. However, current experience within capital works contracting shows that contractors:

- Are risk averse and will push back on risks that they cannot control

- Are unwilling to take any escalation risks for projects exceeding 12 months, making lump sum pricing difficult to achieve
- Have very little control over overseas supply chains
- Have resourcing challenges due to a nationwide skills shortage, which makes them hesitant to guarantee a delivery schedule, resulting in push back against taking on liquidated damages risks.
- Are inflating pricing when asked to take on risk.

To keep pricing under control and achieve an equitable risk allocation that contractors are willing to accept, we have embedded the following risk mitigation actions into the WSB project procurement strategy:

Early Contractor Involvement

The process engages the contractor during the detailed feasibility stage of the works, allowing them to develop the design and price, which can then be awarded following the tender phase. To encourage contractors to engage with the ECI process in constrained market conditions, we are evolving this process to ensure:

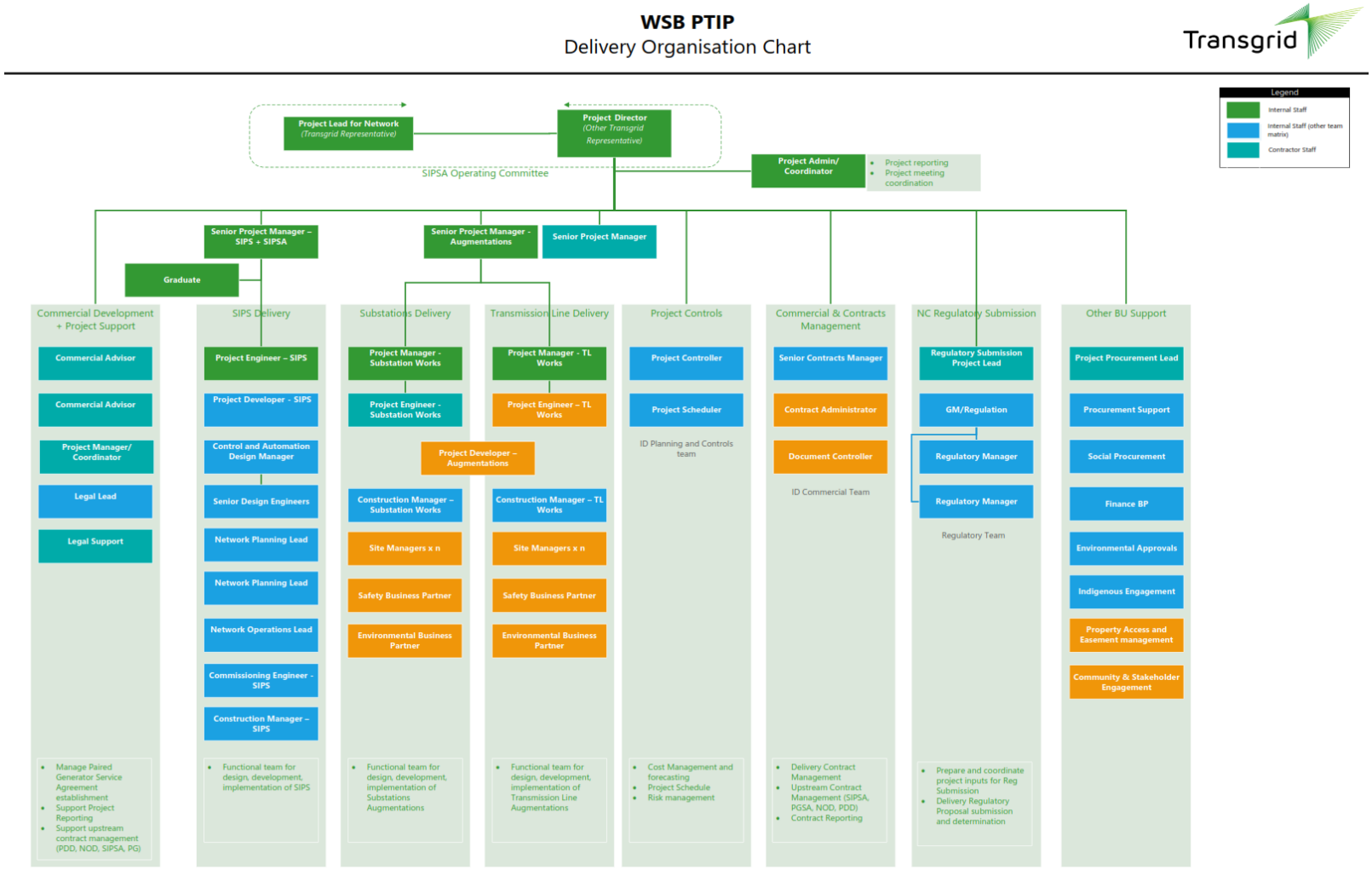
- An equitable allocation of risk
- Trust between the Transgrid and contractor teams
- A rapid escalation path for resolving issues
- Clarity of contract objectives and plan to achieve them

We engaged with contractors through a ECI process for the WSB project to ensure both Transgrid and the contractor were aware of the project objectives, scope and risks early, allowing delivery risks to be mitigated earlier in the procurement process.

Free Issue Equipment and Long Lead Equipment

Transgrid has more buying power than our contractors, enabling us to leverage more competitive terms for standard equipment and long lead items. Our pre-existing commercial relationships and supply arrangements allow us to order LLE early and expedite delivery. We are therefore making direct purchase of key and long lead time equipment, with free issue to contractors, part of the WSB project procurement strategy.

Appendix A – WSB Project Team Structure



Appendix B – WSB Project Schedule

Appendix C – Standard RACI

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
	Define Project																			
1	Attend bid development start up meeting (Contestable)				I	A	C		C										R	
2	Develop and coordinate OFS documents (Non-Contestable Projects)		I				I	C									A	R	R	
	Develop Concept																			
	DESIGN MANAGEMENT																			
3	Allocate Project Developer								I								A	R		
4	Manage, coordinate, and deliver design deliverables						I		C									A	R	
5	Engagement and management of design contractors via ESP						I		I									C	R	
6	Review of design package						I		I	I								A	R	
7	Organise/manage design review meeting						C		A	I									R	
8	Coordinate responses to design RFIs from design contractor (inc. D & C)						I		C									I	R	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
9	Approval of design		A				I		I	I								A	R	
10	Issue Approved for Construction drawings to WD		A				I		I	I								A	R	
11	Ensure project design register (including status) is up to date during construction		C				I		A	R								A	R	
12	Provide Request for Design Services (RDS) to Project Development		I		I	I	A		R									I	I	
	DEVELOPMENT OF PROJECT																			
13	Early Works phase project start up meeting (Contestable)	R		I	C	A	C		C										I	
14	Project handover upon DG2 Approval from BG (Contestable)	A			C	I	I		I				I						I	
15	Sign handover checklist from BG (Contestable)	I			A	R	R		I				I						I	
16	Participate in discussions on Early Works with Client (Contestable)	C			I	A	C		R										I	
17	Scope clarification with Asset Management		A				I		C										R	
18	Coordination with BG for customer requirements	A					I		C										R	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
19	Engagement of construction contractors for ECI arrangements & budget pricing						I	I	R										C	
20	Develop Concept Scoping Report (CSR), Project Cost Estimate (PCE)	I	I				I		C								A	I	R	
21	Coordinate RIT-T						I		C									I	R	
22	Coordinate Planning Approvals						I		C									I	R	
23	Coordinate Property Acquisition						I		C									I	R	
24	Coordinate Environmental Approvals						I		C									I	R	
25	Coordinate Third Party Agreements						I		C									I	R	
26	Allocate Project Manager or engage external project management support resources				A	R	R		I	I								I	I	
27	Preparation of Infrastructure Delivery advice and estimate		I		A	C	C		R		C		R						I	
28	Coordinate estimates from estimating team and provide BOE					I	I		C								A	I	R	
29	Create PPM		A		I	I	I		I										C	
30	Set-up Project Management Systems (TeamBinder, Lessons Learnt Register, etc.)					I	I	I	A	C			R					I	C	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
31	Update schedule in PPM				A	C	C		R		R							I	C	
32	Project handover including all handover documentations				I	I	C		C		I		I				A	C	R	
33	Sign handover checklist from WD/PD				A	R	C		I		I		I					I	C	
34	Confirm delivery strategy - Project Delivery Model Tool completion			I	A	R	C		I		I		I					C		
35	Confirm Principal Contractor assignment (safety)				A	R	C	C	R	C		C								
36	Prepare Project Approval Document initiated from PDGS need site, monitor and manage the review and approval workflows				A	C	C		R											
37	Develop detail project/construction program		I	C	I	I	I	I	A	C	R	I			I				C	
38	Complete bi-monthly Project Health Check					I	A		R	C										
39	Ensure scope of Project Agreements (i.e., customer contract) aligns with the latest approved PCE. (Contestable)	I			I		A		R									I	C	
40	Review exclusions and assumptions within the Project Agreement (Contestable)	I			I		A		R									I	C	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
	PROJECT PLAN																			
41	Draft project plan			C			C	C	A	C		C			C				C	
42	Project Kick-Off Meeting			I	I	I	A	I	R	I		I			I		I	I	C	
43	Final Project Plan	I	I	C	I	C	A	C	R	C		C			C			I	I	
44	Draft Outage Plan					A	C	R	C		C								C	C
45	Draft Resource Plan					A	C	C	R	C	I								I	
46	Book detailed outages		C				I	C	A	R	C									
47	Ongoing Updates of Project Plan					I	C	C	A	C		I								
48	Pre & Post POS Audit Planning			I	I	I	C		A	I		I								
49	HS&E Audit planning				I	I	I	C	C	C		A								
	STAKEHOLDER MANAGEMENT																			
50	Develop Stakeholder Communications Plan			I			C	C	A	C		I			R				C	
51	Implement Stakeholder Communications Plan			I			A	C	R	R		I			C					
52	Monitor and Record Stakeholder Interactions				I	I	A	C	R	R		I			C					
	COST AND TIME MANAGEMENT																			

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
53	Update and Maintain PPM program and forecast for the project with all resource assignments				I	I	A	C	R	C	R									
54	Develop & Maintain risk, change, opportunity, lessons learned registers in PPM				I	I	A	C	R	C									C	
55	Update monthly forecast				I	I	A	C	R	C									C	
	PROJECT REPORTING																			
56	Prepare Weekly Report				A	R	R	C	R	C									C	
57	Prepare monthly executive and financial reports				A	C	C		R				I						C	
58	Report on individual project performance at Construction Monthly Review meeting				I	C	A		R										C	
59	Report on projects at a program level at Major Capital Program Review Meeting		I	I	A	R	R						I			I		R		
	PROCUREMENT MANAGEMENT																			
60	Coordinate planning data for equipment specification		C				I		C									A	R	
61	Develop Project Procurement Plan			C			A		C									C	R	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
62	Arrange procurement of long lead time items to suit construction program and compile high level BOM prior to handover			R		I	I		C	I							A	C	R	
63	Track and monitor procurement of long lead time items			A		I	C		R	I										
64	Compile full detailed BOM			C		I	I	C	A	C			C						R	
65	Order, track, and monitor of procurement of remaining Materials			R		I	I		A	I									C	
66	Order, track, and monitor of procurement of minor construction material			C		I	I		A	R			C							
67	Identify inspection requirements (offsite)		C	C				C	A	I										
68	Manage equipment receipt on site			I				C	A	R										
69	Create Sourcing Request in iBuy			I					A											
70	Allocate Purchase Order/Quotation/Contract No			A					I											
71	Develop tender documentation			C	I	I	C	C	A	C		C							C	
72	Issue tender			A	I	I	I	I	I	I										
73	Tender site inspections			A	I	I	C	C	R	C									I	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
74	Complete tender site inspection meeting minutes			A	I	I	I	C	R	I										
75	Issue tender site inspection meeting minutes			A	I	I	I	I	I	I									I	
76	Issue tender Addendum			A	I	I	I	C	R	I									I	
77	Preparation of tender evaluation matrix			C	I	I	A	C	R	C									C	
78	Tender clarification			R				C	A	C									C	
79	Complete tender evaluation			C	I	I	A	C	R	C									C	
	CONTRACT AWARD																			
80	Review & Accept Letter of Offer			A	I		I		C											
81	Initiate iBuy Workflow with legal and Risk (ex DER process)			A	I		I		R											
82	Complete Contract Award Paper			I	A	C	C		R	I										
83	Tender Consolidation			A	I		I		R											
84	Issue Letter of Acceptance			A	I	I	I		I	I										
85	Carry out contract establishment meeting & issue minutes			C	I	I	A		R	C									C	
	NOMINATION OF REPRESENTATIVES AND POSSESSION OF SITE																			

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
86	Nominate and issue Principal's Representative Letter (including Temporary arrangements)				A	I	R	I	C	I									C	
87	Nominate and issue Superintendent's Representative Letter (including Temporary arrangements)			A	I	I	I	I	I	I									I	
88	Draft and Issue Possession of Site Letter			C	I	C	A	C	R	C									I	
	CONSTRUCTION RISK MANAGEMENT																			
89	Hold Workshop, Prepare, and Issue Safety in Design Report (SID)					I	C	C	C	C		C					A		R	
90	Arrange and Attend Construction Risk Management Workshop (HAZCON)				I	I	A	C	R	C		C							C	
91	Monitor and Manage Construction Risk				I	I	I	C	A	C		I							I	
	CONSTRUCTION MANAGEMENT PLANS - CONTRACTOR DELIVERY																			
92	Review contractors QMP and ITPs						I	C	A	R									C	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
93	Review contractors Work Health Safety Management Plan (WHSMP)				I	I	I	C	A	C		R								
94	Review contractors CEMP				I	I	I	C	A	C		R								
95	Develop project information & management system folder structure for use and AMC handover				I	I	I	C	A	I										I
96	Approval for Commencement of Work (Hold Point)				I	A	R	C	C	C		C			C					
	CONSTRUCTION MANAGEMENT PLANS - INTERNAL DELIVERY																			
97	Create risk register as an outcome of risk management workshop						A	C	R	C		C							C	
98	Prepare Quality Management Plan and ITPs (incl check sheets)						C	C	A	R									C	
99	Prepare Work Health Safety Management Plan (WHSMP)				I	I	C	C	R	C		A								
100	Prepare SWMS and pre-work risk assessment						I	A	I	R		C								
101	Preparation of CEMP				I	I	C	C	A	C		R								

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
102	Develop project information & management system folder structure for use and AMC handover				I	I	I	C	A	I										I
103	Approval for Commencement of Work (Hold Point)				I	A	R	C	C	C		C			C					
	Deliver Project																			
	CONTRACTOR DELIVERY																			
104	Carry out contract establishment meeting			C		I	C	C	A	I										
105	Review contract/construction program & update PPM						C	C	A	C	R									
106	Review contract/construction program & update project plan		I				A	C	R	C									C	
107	Ensure contractor readiness for commencement of site work					I	C	C	A	R										
108	Monitor, maintain, and update project budget/forecast		I	C		C	C	I	A	C										
109	Prepare, monitor, and manage Risk/Issue/Opportunity/lesson learned register			C		C	C	I	A	C		C	I		C				C	
110	Issue contractual instructions			I	I	I	I	C	A	R										
111	Contractor hand over induction							C	A	R										

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
112	Manage Project Change Request (PCR)		I		A	R	R	C	R	C			I							
113	Respond to Request For Information (RFI)			C			A	C	R	R									R	
114	Manage Extension of Times (EOTs)			I	I	C	C	C	A	C	I								C	
115	Manage Variations and claims			I	I	C	C	C	A	C									C	
116	Manage contractor-initiated VOs and EOT to BG (Contestable)	I		C	I	C	A		R	C										
117	Manage customer-initiated VOs and EOT (Contestable)	R			I	C	A		R	C										
118	Issue site direction and FWD							C	A	R										
119	Manage progress claims			I	I	I	C	C	A	C										
120	Measure progress against program for claims							C	A	R										
121	Ensure use of the project information management system (information, documentation, correspondences etc.) - TeamBinder or equiv.				I	I	R	R	A	R									R	
122	Establish and maintain up to date project information site library				I	I	I	C	I	A									C	
123	Facilitate Project Progress meeting						I	C	A	R										

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
124	Manage Nomination of Sub-Contractor Notices					A	I	C	R	C										
125	Issue certificate of Practical Completion			I	I	A	I	C	R	C									C	
	TRANSGRID DELIVERY																			
126	Maintain risk register as an outcome of risk management workshop						A	C	R	R		C							C	
127	Maintain and update Quality plan and ITPs (incl check sheets)						A	I	R	R									C	
128	Maintain and update Work Health Safety Management Plan (WHSMP)				C	R	C	I	R	C		A								
129	Monitor and Review Compliance of SWMS and pre-work risk assessment						C	I	A	R		C								
130	Monitor control measures of CEMP				C	C	C	I	A	R		R								
131	Facilitate pre-start meeting							I	A	R										
132	Conduct regular site tool box meetings							I	A	R		C								
	SITE MANAGEMENT																			
133	Allocation of Site Management				I	A	R	C	C	I										

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
134	Develop physical filing system structure for use on site				I	I	I	I	I	A			R							
135	Preparation of work package for resources allocation						I	I	A	R										
136	Enter construction resources in PPM						I		A	C	R									
137	Enter construction resources request in TRAC						I	I	A	R										
138	Allocation of resources to the project						A		C	C				R						
139	Return resources to resource pool and feedback on resources performance							C	A	R				I						
140	Ensure WSAT compliance (PSSR Training)				I	I	I	I	R	A		C		R						
141	Induction of all requested TransGrid staff to the project							I	A	R										
142	Monitor site compliance (Safety, Environmental, and Quality)				I	I	C	C	A	R		C								
143	Corrective actions & non-conformances				I	I	C	C	A	R		I								
144	Quality management						A	C	R	R										
145	Site progress meetings						C	C	A	R		C								

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
146	Monitor site resources & progress against construction program						C	C	A	R	I									
147	Record safety statistics						I	I	A	R		I	I							
148	Incident management				I	I	R	C	A	R	I	C								
149	Fatigue management				A	R	R	C	R	R		C								
150	Manage external stakeholders after handover (including notification to landowner prior to construction)				I	I	A	C	R	R		I			C				C	
151	Co-ordinate works between contractor groups & stakeholders during construction						I	C	A	R					C					
152	Verify & record contractual/delays/variation matters on site						C	C	A	R										
153	Waste tracking						I	C	A	R		I								
154	Populate and provide Weekly Performance Report for all project resources					I	C	C	A	R										
	COMMISSIONING																			
155	Prepare & issue commissioning plan						I	C	A	R									C	C
156	Review & approve contractors pre-commissioning plan						I	C	A	R									C	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
	Manage and perform secondary system and communication pre-commissioning activities for TransGrid delivered projects							I	A	I										R
157	Monitor pre-commissioning & commissioning activities						I	C	A	R									C	
158	Manage FAT			I				I	A	I									C	
159	Manage SCAT							I	A	I									C	
160	Pre-SAT site inspection for secondary system							C	A	R									C	
161	Manage SAT							C	A	R									I	
162	Provide 6-week AEMO notification of metering changes via Metering help desk		I					I	A	R			I*							
163	Manage provision of temporary protection settings for energisation		C					I	A	C									R	
164	Compile complete commissioning checklist							C	A	R									C	
	Complete AMC Pre-Energisation Checklist								A	R										C
165	Provide advice of alteration for update of Operating & Scoping Diagrams		I					I	A	R									I	

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
166	Submit clearance certificate and Request to Connect		I					I	A	R									I	
167	Manage Familiarisation Training (as required)							I	A	R										
	Close-out Project																			
168	QA documentation		I				I	C	A	R									I	
169	WAE drawings ESP		I				I		A										R	
170	WAE drawings D&C		I				I		R										C	
171	Sign off Line Rating Advice in PRIM		I			A		C	C	C									C	R
172	Update business system information for in-service equipment		R					I	A	R			R						C	
173	Manage provision of maintenance training packages (for Contract works)		I					I	A	R										I
174	Compile information for handover to Asset Manager (CC. Asset Monitoring Centre)		I	C	A			I	R	R									C	
175	Undertake handover to Asset Manager (CC O&M , AMC)		I			A	I	I	R	R									C	
176	Document defects/ warranty issues			I				I	A	R										

Item	Task	BG	NP&O	CS - Strategic Procurement	H/Infrastructure Delivery	Senior Program Manager	Program Manager (ID)	Construction Manager	Project Manager	Site Manager	Scheduler	HS&E	Portfolio Office	Field Resources	Customer and Stakeholder	Finance	Development Manager (PD)	Program Manager (PD)	Project Developer	Commissioning Group (ID)
177	Manage defect rectification through to end of defect liability period		I	I				I	A	I			I							
178	Finalise defects and liabilities - Issue final payment certificate and release bank guarantee/security			A				I	R	C										
179	Complete project capitalisation		I		A	C	C	C	R							R				
180	Project closeout checklist				I	A	C	I	R	C			I							
181	Project closeout report		A		A	R	R	I	R	C	I		I		C				C	
182	Lessons learnt Workshop		I		I	I	A	C	R	C		C	I		C				C	I

Appendix D – Transgrid Professional and Contracting Panels

Selection only included.

Category/Sub Category	Name	Stream	Suppliers
Advisory Services	Advisory Services	Category 1 - Strategic Advice Category 2 - General Consultation & Transformation Category 3 - Market Modelling Category 4 - Regulation & Economic Services Category 4a - Policy	• ACIL Allen, Baringa, Deloitte, Energeia, Ernst & Young (EY), Frontier, FTI, GHD, Houston Kemp, KPMG, LEK, Port Jackson Partners, PWC, FarrierSwier, Modelogic, Incenta, WSP
Construction Services / Underground Transmission Lines	Civil Works for Underground Cable	Construction Services	• Garde
Construction Services / 1. Substations, 2.Overhead Transmission Lines	Construction Services Panel (Extension)	Construction Services	• Downer, UGL, Zinfra, CPP
People & Safety	HSE Audit	Category 1 - Workplace Health and Safety	• GHD (1st preferred) • Soil Conservation Services • J2M • Shared Safety and Risk (Reserve – ErSed)
People & Safety	HSE Audit	Category 2 - Environmental	• Urban Perspectives (1st preferred) • GHD • Treo Environment • (Reserve – Soil Conservation Services)
People & Safety	HSE Audit	Category 3 - Environmental Management Services	• Urban Perspectives (1st preferred) • GHD • Soil Conservation Services (Reserve- ErSed)

Category/Sub Category	Name	Stream	Suppliers
Legal Services	Legal Services	Tier one	• Allens • HSF • Clayton Utz • KWM • Corrs Chambers Westgarth
Delivery - Supply Chain	Procurement Operations Services Panel		• ArcBlue • KPMG • Infosys • Portland
Delivery - Land, Property & Approvals	Property Services Panel		• Opteon • JLL • Knight Frank
Recruitment Services	Recruitment Panel	Permanent Recruitment and Temporary Labour Hire	• Adecco, BMP Technologies, Chandler Macleod, Drake, Hudson, Libran IT, Michael Page, Peoplecorp, Resourceful Recruitment, Robert Walters, The Next Group, Zancott
Delivery - Land, Property & Approvals	Facilities Management		• BGIS
Delivery - Supply Chain	Fleet		• SG Fleet
ICT	Security Architecture Panel		• DXC and TML
ICT	Technology Services Panel		• Tech Mahindra and TCS setup. Negotiations outstanding for IBM and CapGemini.

Category/Sub Category	Name	Stream	Suppliers
Network Equip / Communications Eqp	DWDM Equipment	Network Equipment	• Nokia
Network Equip / Communications Eqp	Nokia Network Equipment	Network Equipment	• Nokia, Westcon (Nokia Distributor)
Network Equip / High Voltage Equip	33kV Metal Clad Switchgear	33kV Switchgear	• Siemens
Network Equip / High Voltage Equip	Auxiliary Transformers	Dry type Auxiliary and Zig-Zag Earthing Transformers	• TMC for Items 1-3 Dry Type, SGB-SMIT
Network Equip / High Voltage Equip	Capacitor Banks	Network Equipment	• ONE, ABB
Network Equip / High Voltage Equip	High Voltage Equipment	High voltage plant, CB, VT, CT Disconnectors, Earth Switches	• ABB, Siemens, GE, Mitsubishi, EPC, GFF, 50Hz, PLP
Network Equip / High Voltage Equip	Transformer Bushings 220kV and above	Network Equipment	• 50Hz (primary supplier) and ABB (reserve)
Network Equip / High Voltage Equip	Transformer Bushings 66kV & 132kV	Network Equipment	• 50Hz
Network Equip / High Voltage Equip, Transmission Line Equip	Misc. High Voltage Equipment	Insulators, Surge Arrestors, Line Traps	• Graph (Only Item 1), Flowline, ABB, 50Hz, Siemens
Network Equip / Secondary Systems	Auxiliary Power Supply Equipment	DC power system, battery and chargers	• SAFT • HCB • Eaton • Vertiv • Brodribb • 6_1 $I_T C_e S_{kron}$

Category/Sub Category	Name	Stream	Suppliers
Network Equip / Secondary Systems	Digital Substation	IEC61850 Software and hardware	• 2. DT Partners • 3. TEN • (Agreements with CSE Uniserve and Landis & Gyr expired May 2021 and there have been delays with renewal to 30/6/2022 for these suppliers)
Network Equip / Secondary Systems	DWDM – Non-Prescribed	Network Equipment	• Ciena
Network Equip / Secondary Systems	Enclosures Panel	Secondary systems panels and cubicles	• JBM Power • Walker Control
Network Equip / Secondary Systems	Ethernet Switches	Network Equipment	• CSE Uniserve
Network Equip / Secondary Systems	High Speed VF Protection Signalling Equipment	Network Equipment	• DEWAR
Network Equip / Secondary Systems	MPLS	Network Equipment	• Commtel
Network Equip / Secondary Systems	Nokia Network Equipment Support and Maintenance	Network Equipment	• Nokia
Network Equip / Secondary Systems	PLC	Network Equipment	• DEWAR, ABB
Network Equip / Secondary Systems	Protection Relays	IEDs	• ABB, GE, Siemens, CSE, SEL
Network Equip / Secondary Systems	RAD Multiplexers	Network Equipment	• Telecom Networks

Category/Sub Category	Name	Stream	Suppliers
Network Equip / Secondary Systems	Remote Terminal Unit	Network Equipment	• CGI
Network Equip / Secondary Systems	Revenue Meters	Network Equipment	• SEL, Plantweave
Network Equip / Transmission Line Eqp	Poles (extension under progress)	Network Equipment	• Concrete poles - Rocla
Network Equip / Transmission Line Eqp	UGFO	Underground Fibre cables	• Prysmian
Network Services / Easement Management	Access Track Maintenance	Network Services	• Soil Conservation Service (SCS)
Network Services / Easement Management	LIDAR	Network Services	• NM Group
Network Services / Easement Management	Vegetation Management	Network Services	• Eastern Tree Service (ETS), Active Tree Services (ATS)
Network Services / Overhead Transmission Line Maintenance	Aerial Inspections	Network Services	• Sydney Helicopters Pty Ltd
Network Services / Overhead Transmission Line Maintenance	Ancillary Services	Network Services	• Zinfra
Network Services / Overhead Transmission Line Maintenance	Calibration Services	Network Services	• TR PTY Ltd

Category/Sub Category	Name	Stream	Suppliers
Network Services / Overhead Transmission Line Maintenance	Climbing Inspections	Network Services	• Zinfra
Network Services / Overhead Transmission Line Maintenance	UGI Inspections	Ground line Maintenance	• UAM
Network Services / Substation Maintenance	Disposal of contaminated waste	Network Services	• Blue-chip
Network Services / Substation Maintenance	HV Testing	Network Services	• Verico (preferred supplier) • Mondo (secondary supplier)
Network Services / Substation Maintenance	Oil Testing	Network Services	• Verico (preferred supplier) • Mondo (secondary supplier)
Network Services / Substation Maintenance	Transformer Oil	Network Services	• Molekulis Pty. Ltd.
Network Services / Substation Maintenance	SF6 Gas Management	Network Services	• ABB
Technical Services	Engineering Services	Type - 1 - Packaged Engineering Works (Complete Project Design)	• AECOM, Aurecon, Beca, (APD - Reserve Member)
Technical Services	Engineering Services	Type 2 - Earthing Measurement and Design	• Misi, APD
Technical Services	Engineering Services	Type 2 - Secondary Systems Design Works, Control Systems	• CPP Electre, APD, (AECOM - Reserve Member)

Category/Sub Category	Name	Stream	Suppliers
Technical Services	Engineering Services	Type 2 - Secondary Systems Design Works, Protection and Market Metering Systems	• DEL Engineering, APD
Technical Services	Engineering Services	Type 2 - Automation Design	• DEL Engineering, APD, CGI
Technical Services	Engineering Services	Type 2 - Underground Cable Design	• Cable Systems Engineering
Technical Services	Engineering Services	Type 2 - Independent Engineering Services	• SMEC, APD, (AECOM, Aurecon and Beca Reserve)
Technical Services	Engineering Services	Type 2 - Geotechnical Services	• SMEC, Douglas Partners (Aurecon and Beca - Reserve using Macquarie Geotech)
Technical Services	Engineering Services	Type 2 - Environmental assessment	• WSP, Umwelt, AECOM, GHD (Reserve)
Technical Services	Engineering Services	Type 2 - Heritage Services	• WSP, Umwelt, GHD (Reserve)
Technical Services	Engineering Services	Type 2 - Ecological Services	• OzArk, Umwelt, AECOM (Reserve)
Technical Services	Engineering Services	Type 2 - Power Systems Analysis	• Mitton, Digsilent, GHD, PSC, Aurecon (Reserve)
Technical Services	Engineering Services	Type 2 - Strategic Asset Mgt	• AMCL, GHD, Aurecon, Jacobs, Cutler Merz (Reserve)

Category/Sub Category	Name	Stream	Suppliers
Technical Services	Engineering Services	Project Manager Services (Short Term or Long Term)	• Any of ESP Panel Members
Technical Services	Quantity Surveying	Technical Services	• TBH
Delivery - Land, Property & Approvals	Travel Services sub agreement		• Qantas
Delivery - Supply Chain	Stationery		• WINC
Delivery - Supply Chain	Logistics Services Provider		• StarTrack (AusPost)
Construction Services / Telecommunications	Telecommunications Pre- qualification Panel	Telecommunications	• Archos Group • Wavelength • T&T King
Delivery - Supply Chain	Mobile Plant & Site Facilities Hire		• Borger Crane Hire and Rigging • Boom Logistics Carrington Centurne Pty Ltd • Lincon Logistics Pty Ltd • Instant Access Australia Pty Ltd • Riverina Crane Services Pty Ltd • Rollers Australia Pty Ltd