

5.12

Resourcing and delivery strategy for 2019-24 period

Content

EXECUTIVE SUMMARY	3
1. INTRODUCTION	5
1.1 Document outline and purpose.....	5
1.2 Exclusions.....	6
2. OUR PERFORMANCE TRACK RECORD	7
2.1 Current period performance.....	7
2.2 Phase 1 Transformation Program	9
2.3 Embedding efficiencies and focus on continual improvement.....	11
3. KEY INITIATIVES TO SUPPORT THE DELIVERY OF THE 2019-24 WORK PLAN	12
3.1 Organisational restructuring to support effective delivery	12
3.2 Integrated Works Management Office (IWMO)	14
3.3 One Plan	16
3.4 Improving end-to-end planning and delivery processes	18
3.5 Positioning Ausgrid for success.....	19
4. OUR 2019-24 WORK PLAN	21
4.1 Overview of Work Plan	21
4.2 Key changes in work composition	22
4.3 Key implications from forecast work plan	26
5. WORK PLAN RESOURCE REQUIREMENTS.....	27
5.1 Demand and supply analysis for the 2019-24 regulatory period	27
5.2 Key findings	30
6. RESOURCE & DELIVERY STRATEGIES	32
6.1 Strategic considerations	32
6.2 Workforce strategies	33
6.3 Outsourcing strategies.....	36
6.4 Impact of Ausgrid's Enterprise Bargaining Agreement.....	38
6.5 De-risking the delivery of the 2019-24 work plan	39
APPENDIX A: FORECAST APPROACH.....	40
APPENDIX B: DEMAND ANALYSIS	44
APPENDIX C: SUPPLY ANALYSIS.....	45
APPENDIX D: EBA CONSULTATION PROCESS	47

EXECUTIVE SUMMARY

Ausgrid has developed a Resourcing and Delivery Strategy (Delivery Strategy) to ensure the efficient delivery of the works program (including capital and maintenance activities). The Strategy has been developed to ensure that we have the capability and capacity to deliver our current and future works program.

Our capex program in the 2019-24 regulatory period is forecast to total \$3.1 billion. In this current regulatory period, Ausgrid expects to spend \$400 million (or 11%) less than the AER's total capital expenditure allowance for 2014-19. This expenditure shortfall is primarily due to improving governance processes to better target our investment and ensure projects are scoped and costed more efficiently; more outsourcing to external service providers; and improving the productivity of our internal labour force.

During the 2014-19 regulatory period, we undertook a significant Transformation Program aimed at identifying lower cost options for managing our business, identifying efficient and prudent opportunities to defer investment and implement operational changes to refocus our business so that it is more aligned to the operational practices of a private business and more attuned to customer needs.

As part of Phase 1 (2015/16 – 2016/17) and Phase 2 (2016/17 – 2017/18) of our Transformation Program, we have sought to re-design our operational structure to increase focus on delivery of our work plan; optimise our workforce size in accordance to our network size and growth; implement changes to our work practices and processes to drive productivity improvement; simplify governance to ensure the focus on delivering business outcomes and increase internal capability in project and contract management.

While implementing these initiatives slowed down the delivery of capital works during 2015/16 and 2016/17, the benefits of these initiatives are beginning to flow through in 2017/18 and will continue throughout the remainder of the current regulatory period. We are delivering an uplift of 20% of capital works in 2017/18 compared to 2016/17 and are on track to grow our capacity for delivering the increased forecast work plan for the 2019-24 regulatory period.

The 2019-24 forecast capital work is characterised by an increase in the capital program of works, particularly in replacement programs which are necessary to maintain the level of safety and reliability of the network; continued transition from large green field work to brownfield work, which are greater in complexity and risks; and move of transmission / sub-transmission to distribution level work. Maintenance work volumes moving forwards are relatively flat, due to significant transformation changes implemented during the current regulatory period, which have enabled us to achieve a more efficient and sustainable maintenance profile moving forward.

Understanding the changes in work demand composition and location is important from a resource planning perspective as the nature, characteristic and complexity of work tasks determine the type of skills and experience required and influences the choice of delivery model and strategies adopted.

Our initial workforce analysis has indicated that overall there is a shortfall in the number of internal resources available for delivering our forecast work plan for the next regulatory period. The early identification of gaps in either resourcing numbers or in particular skills, allows us to develop appropriate strategies aimed at bridging this gap efficiently. In particular, these strategies are aimed at ensuring that we have the right resources, with the right skill sets, in the areas where work is required to be delivered, at the right time.

A key strategy for optimising our internal workforce, includes increased multi-skilling where we skill or team up resources where there is a short term resource shortage or need for longer term resourcing flexibility. We will also continue to implement cross regional sharing of resources where it is cost efficient to do so. This allows us to efficiently close the resource shortfall by re-allocating available resources.

Another key part of our strategy is to continue to outsource work where we have identified that it is the most cost efficient and commercially advantageous option to deliver the work. Through our continual partnership with a range of service providers and our knowledge of the market capabilities, we are confident that we are able to source the required external resources in the local labour market.

While we have been successful in working within the constructs of our industrial relations framework, we reached agreement on a new enterprise agreement in March 2018, which will be active from the date the agreement is approved by the Fair Work Commission. The new agreement provides greater workforce flexibility and efficiency outcomes for Ausgrid, including:

- More flexible and broad-banded employee progression through the introduction of the Career Capability and Remuneration framework
- Relaxing of involuntary redundancy rules
- Faster dispute resolution processes
- More effective consultation process that will facilitate business change.

These arrangements will support our internal workforce flexibility across skills and regions and our ability to select the most efficient and effective delivery model.

1. INTRODUCTION

This document sets out our capability to deliver the network capital expenditure (capex) and maintenance expenditure forecasts (collectively referred to as “work plan”) outlined in our 2019-24 regulatory proposal. Specifically, this document provides an:

- Overview of our work plan, delivery performance, and continual improvement journey
- Outline of the internal processes and governance frameworks we have in place to manage and facilitate the effective delivery of the forecast work plan
- Overview of our assessment of the future resourcing needs to deliver the forecast work plan
- Outline of the key delivery strategies we will use to manage identified resourcing constraints and support the efficient delivery of the proposed work plan.

1.1 Document outline and purpose

The primary focus of this document is to demonstrate that we have the necessary capability and resources available to deliver the proposed network expenditure programs, and in a manner which mitigates the risk of resourcing constraints and additional costs being incurred.

Sections 2 and 3 of the document, demonstrate that we have in place the right governance and processes to support the effective and efficient delivery of the forecast work plan outlined in Section 4. Sections 5 and 6, demonstrate that we have the necessary resources and capabilities to deliver the activities outlined in Section 4, and prudent strategies to support the efficient delivery of our proposed expenditure programs. A high level summary of each section and its key focus areas is outlined below:

- **Section 2: Our performance in the current regulatory period** – this section discusses Ausgrid’s delivery performance in the current regulatory period. In particular, this section:
 - Outlines changes to our circumstances and the impact this has had on delivery
 - Discusses delivery constraints identified as part of our focus on continual improvement
 - Outlines the actions we have taken to address these constraints and improve delivery efficiency.
- **Section 3: How we are transforming our business** – this section outlines the key transformation initiatives that Ausgrid is embedding in its operations to ensure that it has the right governance and structures in place to support effective delivery of the forecast work plan.
- **Section 4: Our forecast work plan** – this section assesses the delivery requirements for the forecast work plan to enable resourcing analysis.
- **Section 5: Resource requirements for the forecast work plan** – identifies what resources are needed to deliver the overall portfolio of works, and seeks to identify any gaps between the demand and supply of resources (and/or skill sets) to enable the development of strategies to bridge supply/demand resourcing gaps.
- **Section 6: Resource and delivery model strategies** – outlines a framework for selecting the optimal mix of internal and external resources for delivering projects and programs of work efficiently and consistent with Ausgrid’s risk management practices, and key strategies for addressing supply/demand resourcing gaps.

1.2 Exclusions

While our overall forecast capex and operating expenditure includes non-system expenditure related to IT and property, and other business support functions, the resource requirement and delivery of these works are outside the scope of this document.

2. OUR PERFORMANCE TRACK RECORD

This section discusses our delivery performance in the current regulatory period, and explains key variances between our actual and forecast delivery. In addition, this section outlines key improvement initiatives we have implemented during the period to further enhance our delivery capabilities and effectiveness.

Examining our delivery performance is relevant, as it not only indicates whether we have the necessary capability to deliver our forecasted 2019-24 work plan, but also enables us to identify lessons learnt and to define associated improvement opportunities.

We are committed to finding new ways to enhance our performance to deliver greater value to our customers. As part of our continual improvement journey, we have identified a suite of new initiatives to further improve our delivery capabilities. We are currently in the process of implementing these new initiatives, the benefits of which will be realised during the 2019-24 regulatory period and will help support the delivery of work outlined in our 2019-24 work plan. These initiatives are discussed in further detail in Section 3.

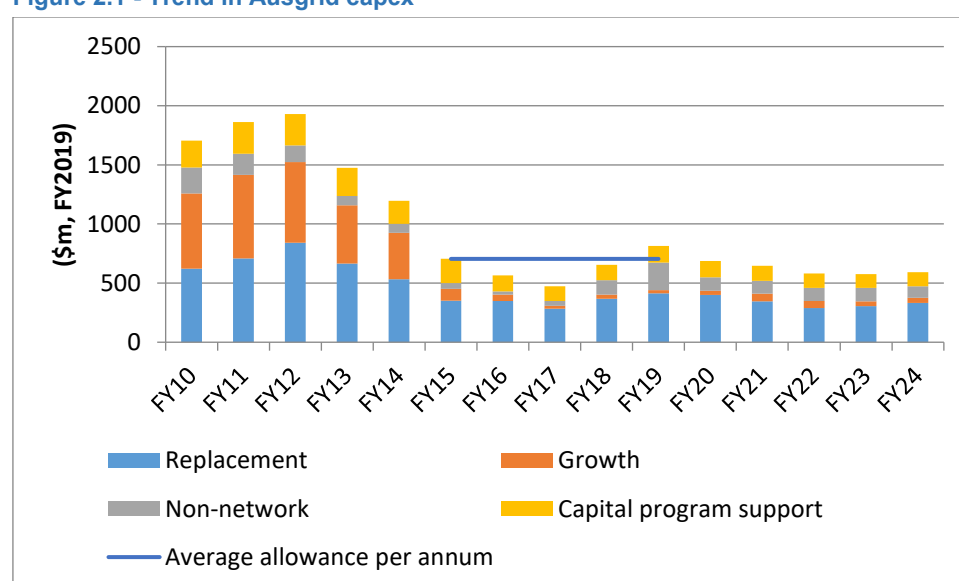
2.1 Current period performance

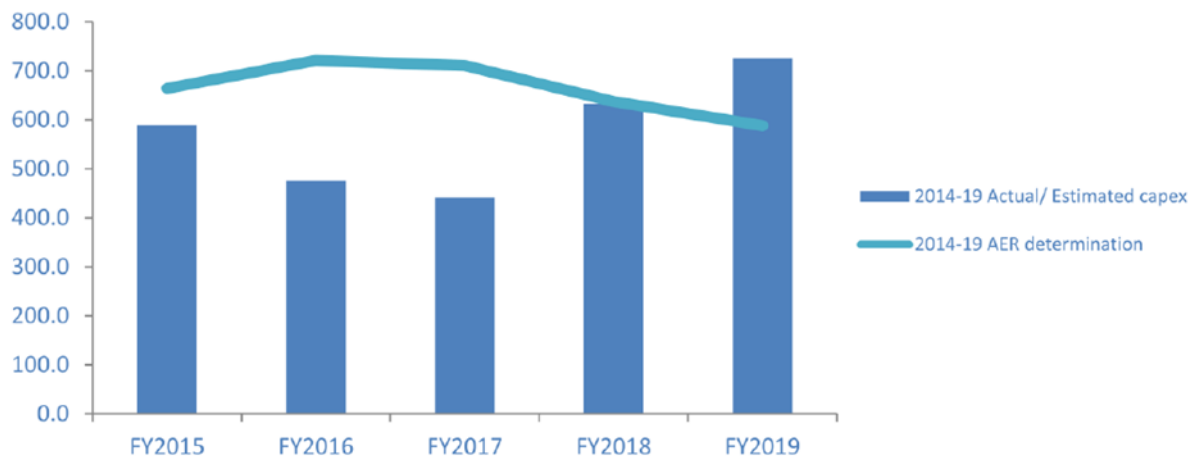
2.1.1 Network Capital Performance

Figure 2.1 shows Ausgrid's actual and estimated capex expenditure for the current period relative to the AER's 2014-19 allowance. We are anticipating to spend 11% less than the AER's capex allowance for the current period, the main reasons for which are:

- Identifying lower cost options for delivering the capital work portfolio
- Identifying efficient and prudent opportunities to defer investment
- The implementation of changes to Ausgrid's business structure and governance process to refocus and transform its business so that it is more aligned to the operational practices of a private business and more attuned to our customers' needs.

Figure 2.1 - Trend in Ausgrid capex





It is worth noting that the large decrease in spend during 2015/16 and 2016/17 corresponds to the dissolution of the Networks New South Wales (NNSW) joint venture between Ausgrid, Endeavour Energy and Essential Energy; and the sale of the majority share of Ausgrid's business to Australian Super and IFM. During this period we underwent a first wave of transformation aimed at transitioning the operating model, "right-sizing" our workforce, and implementing changes to our work practices and processes to further embed efficiencies and productivity improvements¹. While implementing these initiatives slowed down the delivery of capital works during 2015/16 and 2016/17, the benefits of these initiatives are beginning to flow through in 2017/18 and will continue throughout the remainder of the current regulatory period.

2.1.2 Network Maintenance Performance

During the current period, Ausgrid has implemented key maintenance transformation initiatives and reforms and undergone a significant transformation process to re-shape and re-focus our business so that we:

- Are more efficient in our delivery processes and execution of work;
- Are positioned to maintain our current levels of reliability, quality and security of electricity supply at a price which is affordable for our customers;
- Are better able to quickly adapt and respond to future changes in our operating environment; and
- Look for new and innovative ways to improve our business processes through an established culture of continual improvement embedded into our business, which enables us to deliver better value to our customers.

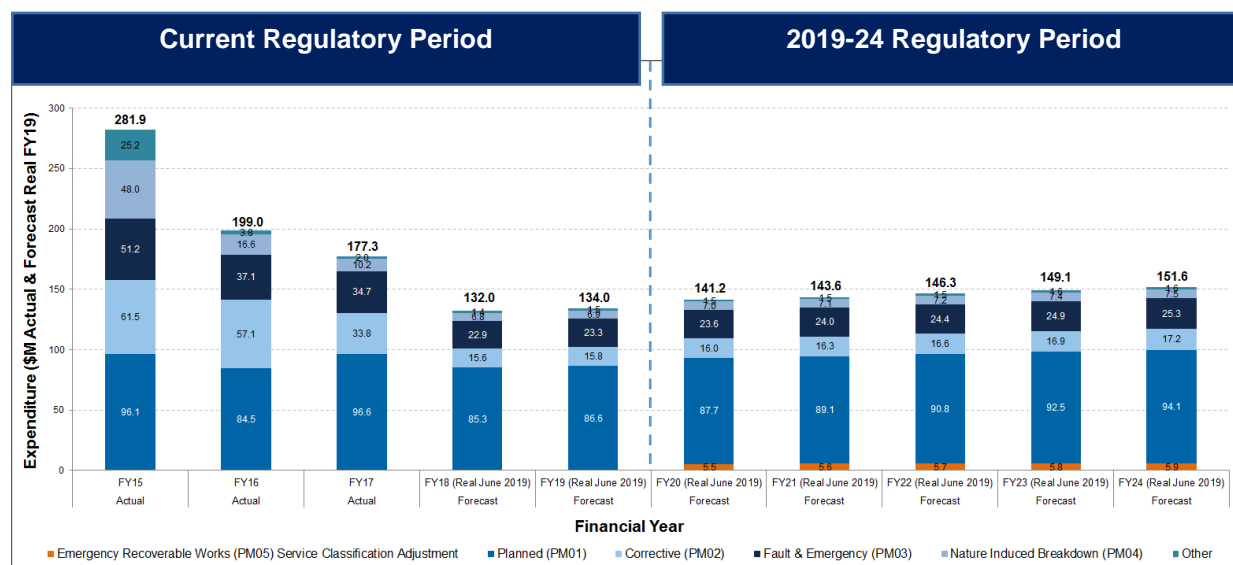
Key maintenance changes and reforms undertaken to achieve these objectives are:

- Improved risk segmentation approach;
- Introduction of new maintenance standards;
- New technology;
- Improved work packaging; and
- Efficient use of contracted services.

These changes have enabled us to transform our maintenance cost base to establish a more efficient base year. In particular, they have enabled us to deliver maintenance work in a more streamlined and cost effective manner so that we deliver better value to our customers.

¹ These initiatives are discussed in more detail in Chapter 6 of Ausgrid's 2019-24 Regulatory Proposal.

Figure 2.2 - Trend in Ausgrid maintenance



2.2 Phase 1 Transformation Program

During the current regulatory period, Ausgrid has implemented a number of transformation initiatives to re-shape and refocus its business. These changes have been aimed at ensuring that our processes and practices are more aligned to that of a private business, so that we deliver better value to our customers in a manner which does not compromise safety, reliability or security of supply.

A key focus of initiatives implemented at the start of the current period has been on getting the fundamentals right. That is, ensuring that we have in place the appropriate operating model with robust governance and processes, and the 'right sized workforce' to deliver value to our customers and improve our operations so that we are able to efficiently respond to changes in our operating environment.

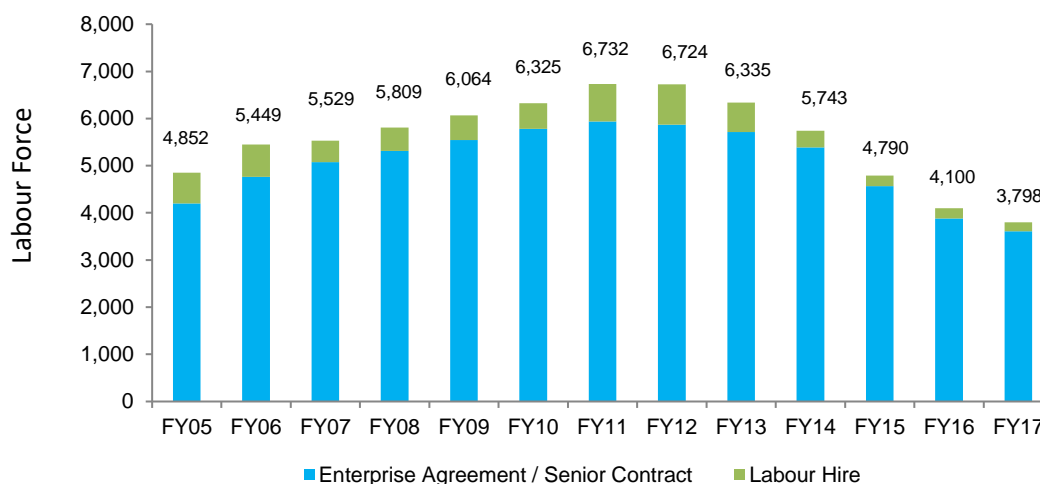
We first began implementing the first wave of our transformation and continual improvement initiatives in 2015. This section provides an overview of the key initiatives implemented as part of our Phase 1 Transformation Program to improve our operational effectiveness and delivery capabilities. Initiatives discussed in this section include:

- those aimed at reducing labour costs by reducing the size of the workforce and increasing productivity to reduce the overall costs and resources required to deliver our capital and maintenance programs;
- establishment of a new Asset Manager – Service Provider model focussing on asset ownership and management, and core contract management capabilities. This included developing an improvement program and implementation strategy to build our internal capacity to more effectively manage projects and contractors;
- initiatives aimed at improving our scheduling and project management capabilities to drive accountability for projects and the field resources they use.

2.2.1 Right sizing the workforce

During the current period, a key focus for us has been 'right-sizing' the workforce to achieve a more efficient work base. We have actively sought to manage our workforce and improve productivity within the construct of the current industrial environment, which does not allow for an employee's employment to end involuntarily. Figure 2.3 shows the workforce reductions we have achieved to date and how our resourcing levels have changed over time.

Figure 2.3 - Ausgrid's labour force reductions (full time equivalent (FTE) employees)²



As shown by Figure 2.3, our current workforce levels are now lower than resourcing levels in 2004/05. The historical increase in resourcing levels were due to the volume of work forecasted in the 2009-14 regulatory period, which was driven by the need to replace ageing assets to meet stringent reliability conditions, and to manage increasing peak demand driven.

However, during the 2009-14 regulatory period, there have been a number of changes to our operating environment that no longer necessitates the need for such a large workforce base, including the sale of Ausgrid's retail business and end of the transitional services agreement between Ausgrid and TRUenergy (now EnergyAustralia), which saw Ausgrid employees providing retail related services to the retail business. As a result we have proactively sought to 'right-size' our workforce to reflect these changes. In particular, we have sought to optimise the size of our field force to match changes in capital and maintenance program volumes, while continuing to respond to unplanned work such as faults and emergencies to maintain safety, reliability and security of supply to customers.

We have achieved our workforce reductions through a number of different workforce strategies aimed at managing identified employee surpluses. Further details on these strategies are provided in Section 6.

2.2.2 Initiatives to support delivery and improve capabilities

During 2014/15 and 2015/16, Ausgrid implemented a number of initiatives aimed at embedding 'the right fundamentals' in its operations. Summarised below are the key initiatives implemented to improve our delivery capabilities so that we can deliver more with less fixed resources.

² Ausgrid Regulatory Proposal, Chapter 6 (Operating Expenditure), section 6.2.2. Numbers include Ausgrid employees and labour hire only and exclude third party contracted services reported to IPART in line with obligations under the *Electricity Networks Assets (Authorised Transactions) Act 2015*. These figures also include employees within Ausgrid's retail business up to 1 March 2011, and employees providing retail related services (including customer service, billing, call centre, contract management and data performance management) to the retail business under the transitional services agreement between Ausgrid and TRUenergy (now EnergyAustralia) until March 2015.

Initiative	Description
Establishment of Asset Manager – Service Provider operating model	This initiative was aimed at providing an increased focus on asset ownership and management. It provides greater clarity in accountabilities from asset strategy development, investment identification through to planning and delivery of the work. The Asset Manager aspect of the model brings together the Engineering, Network Development, and Strategic Asset Management functions. The Service Provider provides an enhanced focus on the efficient delivery of Ausgrid's work plan, with a reduced workforce-to-volume of capital and maintenance program.
Creating a centre of excellence in contract and project management for network related contracts, and building contract capability to promote a consistent level of maturity across all delivery teams	<p>The focus of the improvement program was on:</p> <ul style="list-style-type: none"> Aligning accountabilities in the project and contract management Building and closing project and contract management skills gap across delivery teams Implementing centralised systems and toolkits Developing and implementing procurement / sourcing strategies.
Initiatives to improve field productivity and efficiencies through improved warehousing and logistics and use of blended delivery models for major projects	<p>These initiatives included:</p> <ul style="list-style-type: none"> Warehousing and logistics – improve operational capability, efficiency, flexibility and cost by implementing the Network Optimisation Model. Blended delivery model for major projects – implemented a blended delivery model for the delivery of major projects. This will deliver a market tested, cost competitive services which will reduce overall costs of projects. By blending service provision between internal and external providers, this will create competitive tension and drive efficiencies.

2.3 Embedding efficiencies and focus on continual improvement

Embedding initiatives to get our delivery fundamentals right has required management focus and taken time. This has had a subsequent impact on our delivery capability early in the current period, however the benefits from these initiatives are already starting to be realised in 2017/18. While further efficiencies and productivity improvements are expected to flow through from these initiatives, we have already commenced implementing the next wave of transformation initiatives (Phase 2).

Having focused on getting the basics right during the first half of the current period, our focus for the remainder of the period is on refining our operating structure, processes and governance arrangements to further drive continuous improvement in our operations so that our operations are more aligned to that of a private business. Further details on these initiatives are discussed in Section 3.

3. KEY INITIATIVES TO SUPPORT THE DELIVERY OF THE 2019-24 WORK PLAN

The commencement of Ausgrid's new ownership arrangements in December 2016 has sparked further transformation changes to our business (Phase 2 of the Transformation Program) aimed at further improving our operational effectiveness and delivery capability.

A component of Phase 2 is focused on driving further efficiencies to reduce our underlying costs in providing services, by improving our end-to-end delivery processes and the efficiency of our field staff. We are seeking to embed these initiatives during 2017/18 and 2018/19 to ensure that we have the right processes and capabilities in place to:

- Support the delivery of our forecast 2019-24 work plan using a reduced pool of internal resources
- Review, optimise and deliver the backlog of delivery works that occurred as a result of embedding Phase 1 initiatives.

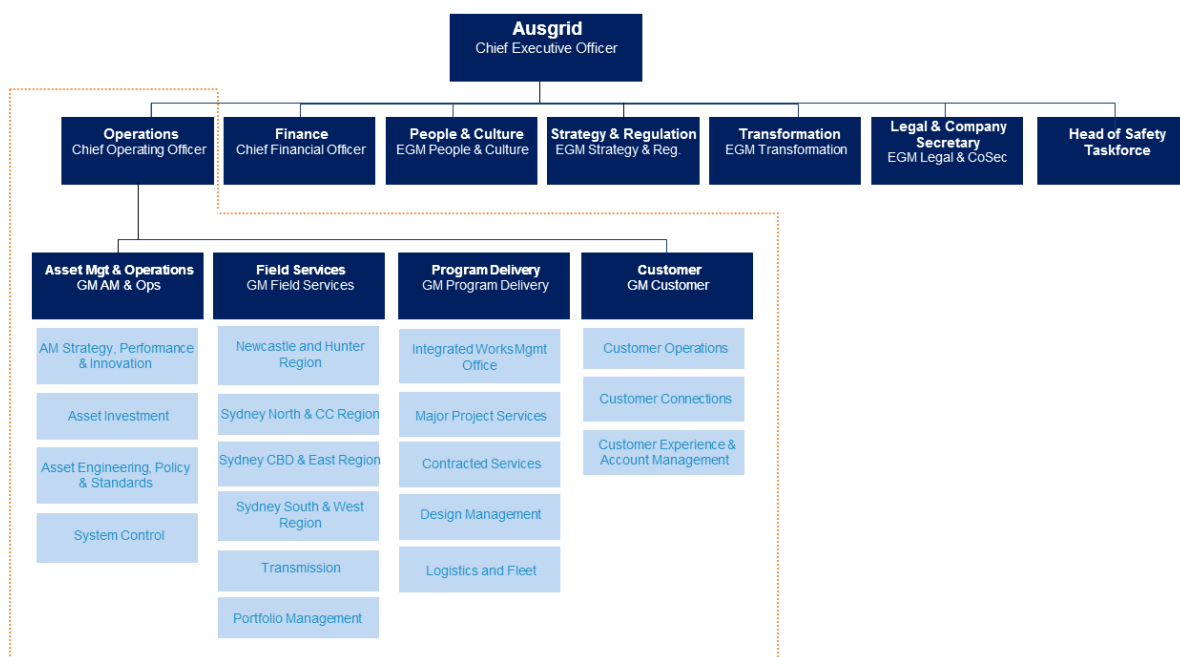
The following sections describe the key initiatives that we are currently in the process of implementing to support the deliverability of our forecast work plan discussed in section 4.

3.1 Organisational restructuring to support effective delivery

We have restructured our network operation functions to better support operational effectiveness and promote efficiencies in work delivery. The new structure includes an "Operations" Division, depicted by Figure 3.1, which:

- Provides clearer accountabilities across the asset management and work delivery value chain
- Streamlines overall processes and simplifies governance structures
- Promotes greater alignment and efficiency in work delivery through greater standardisation of work practices, improved bundling of work and stopping unnecessary work
- Embeds customer-driven decision making in investment governance.

Figure 3.1 - Ausgrid's current organisation structure



As illustrated by Figure 3.1, we have restructured our Operations division around four key areas:

- Asset Management and Operations (AM&O)
- Program Delivery (PD)
- Field Services (FS)
- Customer Operations (CO).

We have restructured our Operational division around these key areas in order to promote a more holistic and integrated works delivery approach that is better aligned to the planning and delivery value chain. Table 3.1 outlines the key functions for each of the areas in the Operations Division.

Table 3.1 - Key functions within the Operations Division

Function	Function Key Responsibilities	Description
Asset Management and Operations	Focuses on identifying and managing the efficient needs of the network, and includes system control, asset management investment, performance and innovation, and engineering policies and standards.	Asset Management & Operations has been re-organised and rationalised to establish the right structural layers and spans of control. This rationalised structure is supported by streamlined processes across planning and network operations.
Program Delivery	Focuses on providing a centralised delivery plan for the portfolio of works with streamlined end-to-end processes and governance.	<p>The group's key accountabilities are to:</p> <ul style="list-style-type: none"> • Improve transparency of the program delivery process • Provide an end-to-end plan for network activities • Oversee the delivery of network activities and provide reporting • Deliver contracted services and major projects • Provide a fleet and logistics service • Provide a centralised in-house design management service. <p>Within Program Delivery, the Integrated Works Management Office (IWMO) has been established to enable the long term successful and efficient delivery of Ausgrid's network capital and maintenance work plan. A more detailed description on the IWMO's functions is described in Section 3.2.</p>
Field Services	Focuses on efficient works scheduling and delivery across Ausgrid's regional structure to build greater agility and flexibility in how Ausgrid responds to network needs.	<p>Establishment of a new Field Services operating model consisting of the following distribution regions: Newcastle and Hunter; Sydney North and Central Coast; Sydney South and West; and Sydney CBD and East. The establishment of these regions aims to provide a consistent regional delivery model, focusing on safety and delivery of work, and to support improved fault and emergency response. A dedicated transmission group provides the specialised capability to support the subtransmission and transmission assets.</p> <p>In addition, a Distribution Portfolio Management function has been established to provide support in works coordination, scheduling and packaging for program of works.</p>
Customer Operations	Focuses on ensuring customer touch points are embedded throughout the deliver process to ensure customers receive a consistent and valuable experience.	Develop a customer centric culture and establish process and frameworks to proactively embed customer input into investment considerations and decision making.

3.2 Integrated Works Management Office (IWMO)

Within Program Delivery, the IWMO has been established as a key enabler to support greater effectiveness and efficiencies in the delivery of the work plan in accordance with business objectives. The IWMO is aimed at promoting the successful, predictable and efficient delivery of Ausgrid's capital and maintenance portfolio by:

- Embedding integrated works matching of work demand with resource supply to identify potential variances, for all network activities
- Optimising the allocation of internal and external resources, and determining the appropriate delivery model to deliver the portfolio
- Prioritising and scheduling the delivery of major capital projects, capital program of works and maintenance programs across the portfolio
- Proactively shifting and smoothing work to reduce peaks and improve resource utilisation
- Providing a single point of reporting, monitoring and insight into delivery performance
- Ensuring accurate system data and information is captured.

The core responsibilities for the IWMO are described in Table 3.2.

Table 3.2 - Key responsibilities of the IWMO

Responsibility	Description
Integrated Works Plan (IWP)	The IWMO is developing an optimised, Integrated Works Plan which balances network needs (as defined by AM&O) and is realistically achievable by internal resources and external contractors. Further details on the IWP is discussed in section 3.2.1.
Delivery management	The IWMO is proactively managing the IWP, ensuring the delivery of the capital and maintenance programs. It also manages changes and updates to the IWP in response to reactive and unplanned work, and provides business stakeholders confidence in the predictability and achievability of desired outcomes.
End-to-end oversight and monitoring	The IWMO provides end-to-end oversight and monitoring of the network capital and maintenance portfolios across Ausgrid. The IWMO is seen as the central place to understand delivery progress of the approved plan, providing confidence in reported results. It is also a source for analysis and reporting, to provide decision support to management.
Business improvement in delivery	The IWMO is a central source of continuous business improvement to drive capital and maintenance works delivery efficiency by undertaking post implementation reviews and incorporating lesson learnt back into the process.

Key outputs from the IWMO aimed at supporting our delivery capability are the:

- **Integrated Works Plan** – sets out a detailed view of the future work requirements
- **Integrated Resource Plan** – sets out the resourcing requirements required to support the delivery of the work outlined by the Integrated Works Plan.

The following sections provide further details on the Integrated Works Plan and Integrated Resource Plan to highlight how these initiatives enhance the effectiveness and efficiency of our delivery capabilities.

3.2.1 Integrated Works Plan

Ausgrid's Integrated Works Plan is a rolling three year plan which describes how all capital and maintenance works will be completed under our forecast work plan. Key objectives of the Integrated Works Plan are to:

- Optimise the portfolio of works and our ability to manage planned and unplanned work

- Provide consistency in the projection and estimation of required resources by region and man-hours of each critical skillset
- Proactively shift and smooth work to reduce peaks and improve resource utilisation
- Identify work packages that can be bundled together for more efficient delivery, which reduces overall costs and minimises access to the network
- Provide greater visibility on the status of each project/program through the establishment of consistent key performance measures
- Facilitate the early identification of delivery issues/bottlenecks, to allow for timely intervention and management of risks.

Details on how the Integrated Works Plan achieves the above objectives are outlined in Table 3.3.

Table 3.3 - Summary of key improvements under the Integrated Works Plan

Improvement area	Description
Governance and reporting	<ul style="list-style-type: none"> • Defining and improving how projects / programs are developed and executed to align with network requirements. • Provide certainty that project / program requirements are satisfied at each of the key decision milestones.
Cost estimating and forecasting	<ul style="list-style-type: none"> • Tracking of actual unit rates against forecast to inform estimating, forecasting and cost monitoring. • Analyse internal and external unit rate costs, to inform optimal mix of internal to external resource that will provide the most cost efficient outcomes.
Planning and scheduling	<ul style="list-style-type: none"> • Early identification of work bundling opportunities. • Centralise planning and scheduling. • Consolidation of schedules to provide a single source of truth. • Regular updating of the schedule by project/program managers. • Creation of a work pipeline with appropriate flexibility of 20% to manage changes due to external factors.
Continuous improvement and analytics	<ul style="list-style-type: none"> • Identifying and quantifying drivers of performance. • Use of analytical techniques to define appropriate key performance measures. • Provide consistency in reporting and performance monitoring across all regions. • Monitoring of data integrity and accuracy.

3.2.2 Integrated Resource Plan

Ausgrid uses the analysis generated by its Workforce Analysis Model, to develop an overarching Integrated Resource Plan which is used to support the delivery of its forecast work plan by:

- Providing confirmation on whether the portfolio of work is deliverable and efficient
- Assessing resource shortages or oversupply within critical skill types and location, and identifying strategies for managing identified shortages or oversupply
- Providing an understanding and identification of work that needs to be supported by external resources, and the procurement strategies required to acquire these services.

The Integrated Resource Plan is a key component of the Integrated Works Plan discussed in section 3.2.1 and is managed and updated by the Integrated Works Management Office. The Integrated Resource Plan is updated on an annual basis to align with the annual approval cycle of the Portfolio Investment Plan (PIP)³, and Ausgrid's Statement of Corporate Intent (SCI). The

³ The Portfolio Investment Plan is further detailed in Attachments 5.01 (Ausgrid's proposed capital expenditure) and 5.04 (Prioritisation Investment Plan (PIP) process description).

Integrated Resource Plan provides a five-year outlook of resource requirements. A three-year resource outlook is refined in April / May, aligning to the budget setting process. Outside of this cycle, the Integrated Resource Plan is updated where there has been significant changes in the IWP.

Outlined in Table 3.4 is a summary of the timing and nature of updates to the Integrated Resource Plan to ensure consistency and alignment between Ausgrid's broader business process and objectives.

Table 3.4 - Key initiatives to improve delivery capabilities

Month	Purpose	Governance
November	Annual update	
	<ul style="list-style-type: none"> Alignment with draft SCI and annual PIP approval cycle Alignment with the annual work plan and budget proposal Input to the Ausgrid's Strategic Workforce Plan 	Present the strategy for endorsement to the Network Steering Committee and for approval by the Chief Operating Officer
April / May	Mid-year update	
	<ul style="list-style-type: none"> Alignment to budget setting and delivery plan confirmation for the next financial year 	Present impacts of changes from the Annual Update to the Network Steering Committee and approval by the Chief Operating Officer
July / August	End of year review	
	<ul style="list-style-type: none"> Review performance in the previous year Refine forecast and estimating processes where required 	Present findings and action plan to the Network Steering Committee

3.3 One Plan

In April 2017, we implemented the "One Plan" capital delivery initiative to address a backlog of projects that had been deferred during sale of Ausgrid to the new owners. This followed an extensive investigation into the structural and workforce issues impacting our delivery performance, particularly in respect to the delivery of network capital. Some of the issues included demand-supply imbalances for particular projects, project scheduling, access and delays in approval of projects.

Our "One Plan" establishes a series of tactical measures to address delivery bottlenecks identified as part of our investigation into further opportunities for efficiencies in our delivery performance. Since its inception, and realisation of benefits from Phase 1 Transformation initiatives, Ausgrid is now back on track for delivering against the planned work levels, with a smaller and more productive workforce. In essence, the One Plan aimed to de-risk the delivery of capital by focusing on the following key themes:

- **Continuous refinement of the One Plan** – to create a 'construction readiness' pipeline of work to maximise field labour utilisation
- **De-risking delivery** – through the timely identification and mitigation of known constraints, such as procurement, design, access to network, and skillset constraints
- **Centralised management of portfolio of works across the value chain** – to create greater visibility on progress, clear accountabilities, and alignment of priorities at a regional and portfolio level.

The benefits of this initiative are already being realised in 2017/18, as evidenced by our actual delivery performance during the past six months that has us working to plan to deliver almost

20% more capex compared to 2016/17 to clear the back log of work that was created by embedding in the transformation initiatives.

As a result of the outcomes achieved under One Plan, the initiatives will be embedded as part of the Integrated Works Plan business-as-usual processes and the scope will be expanded to encompass maintenance and other network operation activities to provide consistent and centralised management and governance.

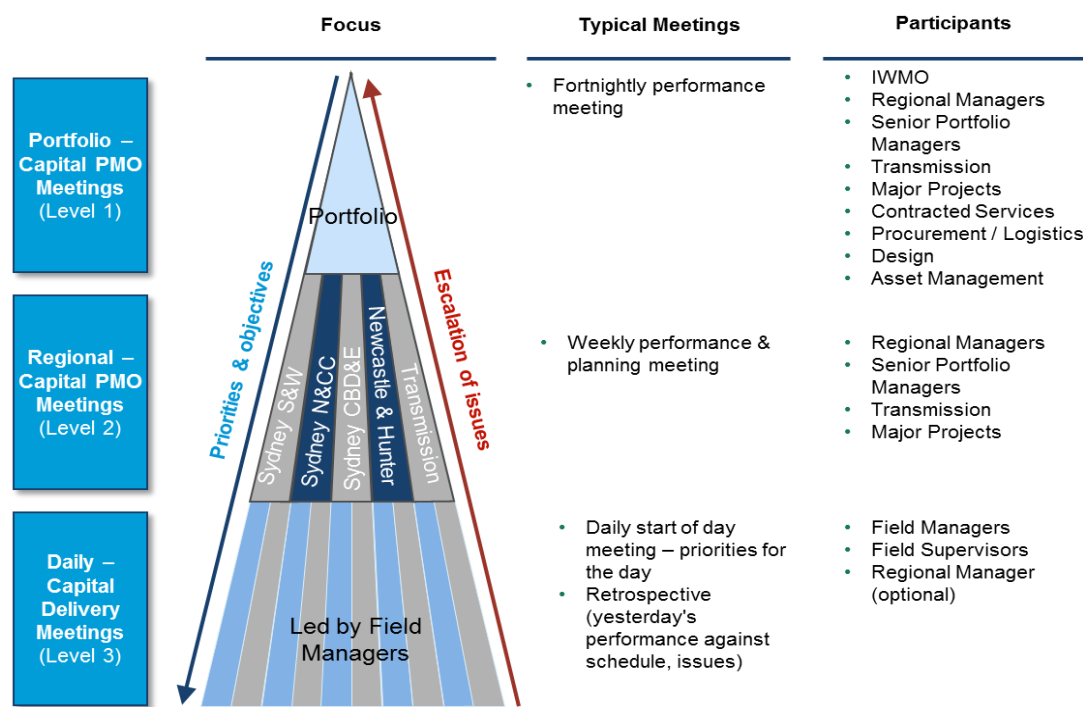
3.3.1 Capital Portfolio Management Office (PMO)

To support the delivery of the One Plan initiative we have established a Capital Portfolio Management Office (PMO) which is aimed at:

- Creating transparency of the forward looking work plan
- Promoting the sharing of information
- Alignment of priorities across the different regions and organisational levels.

The Capital PMO is managed via the IWMO, and in essence establishes the framework for monitoring, progress reporting, and the escalation and management of risks related to the delivery of network capital. Figure 3.2 illustrates the hierarchy of reporting/meetings, meeting frequency, and key participants under the Capital PMO framework. The Capital PMO framework enables a centralised view of progress which allows for early identification of issues/risks so that appropriate actions can be taken to address/mitigate these issues. Dashboard reports track consistent performance measures across all work and regions. Key measures include direct labour hours of work delivered, Gate 3⁴ funding approvals, construction readiness pipeline, and practical completion and work order completions.

Figure 3.2 - Capital PMO framework



3.4 Improving end-to-end planning and delivery processes

There are a number of initiatives focussed on addressing potential constraints in the end-to-end planning and delivery process. These are described in the following sections.

⁴ Ausgrid's gate stages are described in Attachment 5.05 (Investment Governance Framework).

3.4.1 Design and procurement

It is critical to ensure timely design and procurement in the overall delivery process, as this impacts upon project lead times. Lead times can be adversely impacted by design and procurement functions, resulting in project delays, and can subsequently impact resources further down the value chain. To address these potential sources of delays, we have developed a suite of measures which are summarised in Table 3.5.

Table 3.5 - Strategies aimed at mitigating design and procurement delays

Source of potential delay	Mitigation strategy
Design constraints	<ul style="list-style-type: none">• Create more than three months 'bank' of construction ready work• Centralise the design resource pool and job allocation resources• Streamline design requirements and process across regions
Procurement lead times	<ul style="list-style-type: none">• Early engagement with the Procurement team to inform them of the pipeline of work including materials and contracted services required, and provide sufficient time for procurement planning to undertake the required procurement processes• Share draft bill of materials during design and refine through the design process

We have established contracts and panel arrangements in place to allow us to procure required materials and key contracted services quickly at efficient market prices. We have also achieved efficiencies by renegotiating a number of large existing contracts, and consolidating the number of contracts to support our current and forecast work plan.

We will continue to refine our procurement processes with contractors by reviewing key performance measures and incentives; simplifying training requirements; and optimising packaging of works in a way that provides value for money and reduces delivery risks.

3.4.2 Field efficiency improvements

Another core focus area is field delivery. We have assessed and identified a number of initiatives that will improve overall efficiency and productivity of our field resources, subsequently allowing for delivery of more work. These are outlined in Table 3.6.

Table 3.6 - Summary of key field efficiency improvements

Key initiative	Description
Standardise jobs and work practices	The objective of standardisation of jobs and work practices is to provide a standardised and efficient approach to the way Ausgrid completes work in the field. This will be achieved through standardised safe work procedures that have a defined and consistent scope focused on achieving outcomes at an optimised cost. This includes creating standard job templates for a range of common job types integrated within our SAP ERP system, and developing a competency matrix to enable the correct allocation of work crews to jobs. These initiatives will help improve work delivery efficiency.
Improve scheduling and dispatch	We have been improving the maturity of our work scheduling and dispatch capability. Currently we are working to further standardise and optimise the scheduling and dispatch process. To support this, a new tool will be implemented to allow us to standardise and centralise the scheduling process across its regions so that it can more effectively optimise the allocation of work to field crews by enabling real-time updates of the work schedule. This will increase utilisation of field resources, minimise idle time and reduce travel time.
Reengineer field logistics and material handling	This initiative focusses on reducing the time that field resources spend in ordering, handling and transporting materials and equipment. This includes introducing standard kits for selected standard jobs, implementing technology to track materials and reduce waste, and implementing site delivery and site disposal for materials and equipment. This initiative minimises double handling, and is aimed at ensuring that the right materials and equipment are available when and where work is required. This will reduce cost of delivering the work and increase the capacity of field resources.

Key initiative	Description
Optimise access to the network	<p>To alleviate constraints of access to the network, a number of key actions were determined as part of this initiative to introduce a more standardised process for accessing the network, including:</p> <ul style="list-style-type: none"> • Bundling of work and optimising timing of maintenance work to reduce outage requirements on the network • Identifying opportunities for live-line work • Optimising scheduling of work demand and District Operator available time • Optimising field crews and limited operating where by low voltage switching which is typically carried out by the Field Operators (District Operators) can be carried out by the field crew on the job. This reduces the demand for District Operators • Increasing District Operator trainee program as appropriate to meet forecast work demand • Continuing to monitor and leverage overtime (where efficient to do so) to meet peak work demand. <p>The benefits of this initiative are improving utilisation by reducing down-time while waiting for access or when planned work is cancelled. Further, the streamlined process will provide safer access to the network with better visibility and control by System Operations.</p>
Multi-skilling staff and cross-regional utilisation	<p>Work plan compositions across the different regions change depending on the needs of the network and customers. While Field resources are normally managed by the four main regions (as described in the earlier section), where it is cost efficient to do so, Field resources may work across regional boundaries to maximise utilisation across all of Ausgrid resources and minimise overhead costs.</p> <p>Additionally, multi-skilling is also undertaken where identified surplus resources are trained to support resources where constraints exist. We consider this on a case by case basis, when and where (region) to do this, based on the supply-demand balance forecasted and the cost-benefits.</p>

3.5 Positioning Ausgrid for success

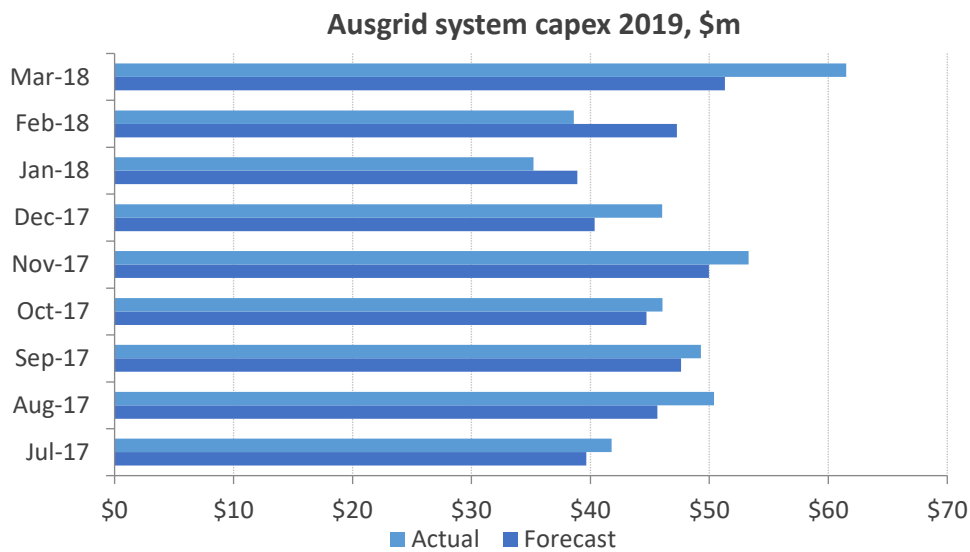
We have undergone a significant transformation process during the current period to re-shape and re-focus our business so that we are:

- More efficient in our delivery processes and execution of work
- Positioned to maintain our current levels of reliability, quality and security of electricity supply at a price which is affordable for our customers
- Better able to quickly adapt and respond to future changes in our operating environment
- Have an established culture of continual improvement embedded in our business, so that we continue to look for new and innovative ways to improve our business processes to deliver better value to our customers.

As noted in Section 2.2, our Phase 1 initiatives were primarily focused on re-shaping our business to get the fundamentals right through ‘right sizing’ our workforce to a more efficient level; establishing better contract and procurement capability; and implementing new business operating models. While the implementation of these initiatives slowed down our delivery performance in the short term, it placed us in a position where we were able to make further refinements to our operating structure, processes, and governance arrangements to significantly improve our delivery performance over the longer term.

The transformation initiatives from Phase 1 and 2 that impacts on our delivery capacity and efficiency of the network capital and maintenance work are already beginning to flow through in 2017/18, as indicated by Figure 3.3, with further benefits expected to be realised in FY19 and the beginning of the next regulatory period as Phase 2 initiatives are completed.

Figure 3.3 - Ausgrid actual delivery over the last 9 months compared to forecast (\$nominal)



The benefits from Phase 1 and 2 initiatives will enable us to catch-up on the delivery backlog created from embedding changes to its operations, so that by the end of the current period we will have installed 1350 kilometres of lines, 18,000 poles and 600 substations to maintain the safety and reliability of our network, while delivering greater affordability to our customers.

In addition, the benefits that will be realised from these initiatives, are intended to position us to be well placed to deliver our 2019-24 work plan outlined in Section 4, with a smaller but more productive workforce that is supported by innovative work practices, and the appropriate use of resource and delivery strategies.

4. OUR 2019-24 WORK PLAN

Our 2019-24 forecast work plan sets out the overarching portfolio of work that needs to be delivered during the 2019-24 regulatory period to meet our legislative and regulatory obligations.

This section is primarily aimed at providing a breakdown of work by expenditure type to highlight key changes in work composition from the current regulatory period. Understanding how our work composition is changing is important from a planning and delivery perspective, as this drives corresponding changes in resourcing requirements and may give rise to surpluses or shortages in the skill sets required to deliver the activities that make up our portfolio of works.

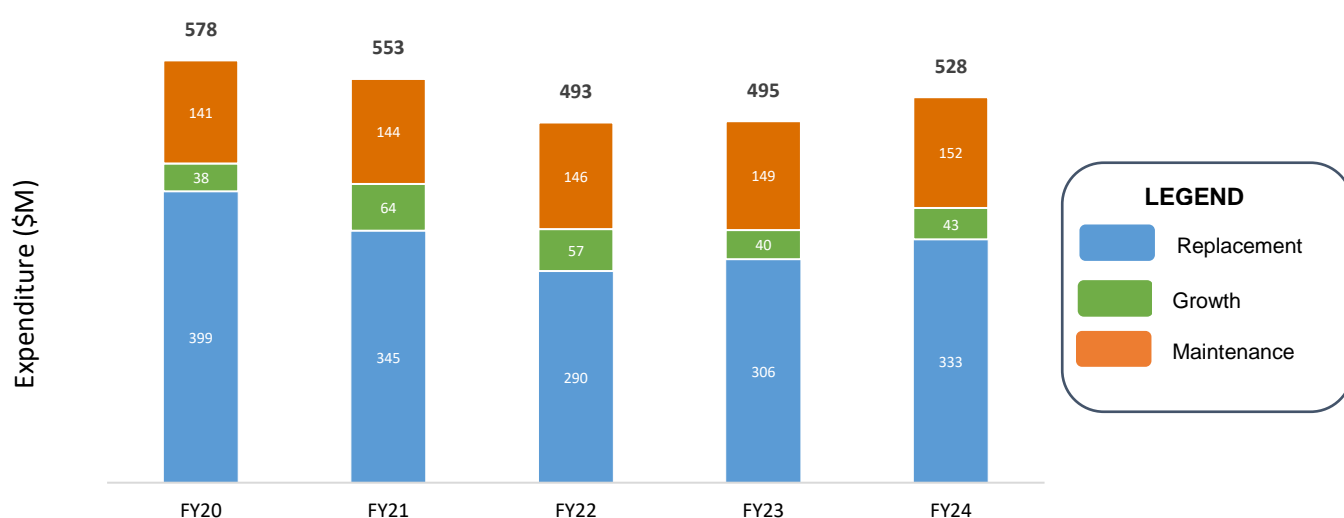
4.1 Overview of Work Plan

Figure 4.1 provides a high level overview of the different works that comprises our electrical network work plan, and highlights the resourcing demands across the following expenditure categories:

- **Replacement (capex)** – refers to replacing and renewing network assets in planned, conditional and reactive programs. Our replacement program is driven largely by assets that are in poor condition and assets that pose a safety risk
- **Growth (capex)** – refers to programs involving connecting new customers and augmenting the network to meet our forecasts of peak demand on the network.
- **Maintenance (opex)** – refers to core network maintenance expenditure relating to planned, corrective, fault and emergency, nature-induced, damage by third party, and non-direct maintenance

As shown by Figure 4.1, our work plan for the 2019-24 regulatory period consists of work relating to both network capex and opex, with capex related expenditure accounting for approximately 70 - 75% of all work to be delivered over the forthcoming regulatory period.

Figure 4.1 - Ausgrid's 2019-24 Work Plan (\$ millions real 2019)



Key outcomes that Ausgrid will deliver under its 2019-24 work plan are summarised in Table 4.1.

Table 4.1 - Summary of key delivery outcomes under the 2019-24 work plan

Description of work	Rationale
Replace 22,000 poles out of a total population of 450,000	Our pole strategy aims to replace poles before they fall down on people or property. Our replacement program targets poles that are degraded from rot, termites or corrosion.
Replace 667 kilometres (km) of overhead conductors out of a population of 25,000km	Our strategy aims to replace conductors before they fall as a result of corrosion, and is aimed at reducing the risk of customers touching exposed wires or risk of bushfires.
Replace 266km of underground cables out of a population of 15,000km	Ausgrid only replaces cables when it is identified that there are reliability, safety or environmental risks that cannot be managed. This work will include replacing 100km of sub-transmission cables that are at risk of fluid leak and 150km of low voltage and conductors which are degraded and pose safety risks.
Replace 147,000 service wires out of a total population of 950,000.	Our strategy aims to increase our planned replacement of service lines that have insulation issues and pose safety risks. Ausgrid has a large population of service wires over the standard life of 35 years that will need to be proactively managed.
Replace 6,505 units of equipment (switches, circuit breakers and panels) out of a total population of 139,000.	Major projects as part of this replace include our 11kv circuit breaker program. These assets are old and pose a high safety and reliability risk, with the potential for whole suburbs to be without electricity supply in the event of a failure.
Replace 885 transformers out of a population of 34,000.	Our approach is to generally only replace transformers when they fail. Ausgrid has a spares strategy to allow us to replace failed transformers to minimise repair time and loss of reliability.
Implement 23 Duty of Care programs	These programs are aimed at fixing issues with equipment to meet safety standards, and are primarily focus on addressing safety, environmental and fire risks.
Implement 14 control and protection system programs	These programs relate to secondary systems (including SCADA, protection and operating technology) to ensure that the network is appropriately monitored and controlled. Key programs include the implementation of the Advanced Distribution Management System (ADMS) to facilitate peer to peer trading and installation of low voltage regulators.
All 450,000 (non SL) poles and associated 26,000km overhead lines will be inspected. 13,000 of 32,000 distribution substations will be inspected. All zone substations (190) and sub-transmission substations (30) and sub-transmission switching stations (16) will be inspected.	Planned inspection and maintenance tasks are carried out to ensure the ongoing safety, environmental and reliability of the electrical network. The information captured is critically analysed to understand the performance of the assets which in turn drives the need for capital investment.

4.2 Key changes in work composition

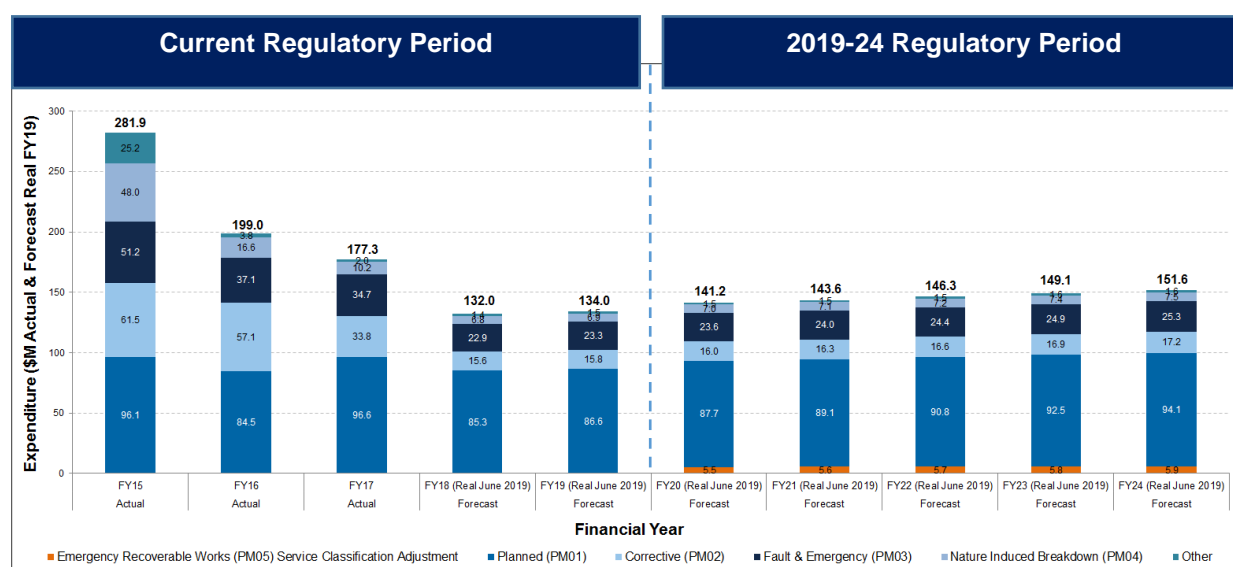
The following sections discuss the changing composition of our work plan by comparing work volumes in the current period against our forecasted work volumes for network capex and opex. Understanding the changing composition of work is important from a resourcing perspective as the nature, characteristic, and complexity of work tasks determines the type of skills and experience required, and influences the choice of delivery model and contracting strategies.

4.2.1 Network maintenance

The success of the actions we have taken to improve the efficiency of our maintenance program are evidenced in Figure 4.2 which shows how maintenance expenditure has changed from the current regulatory period by expenditure category. Our expenditure has reduced significantly during the regulatory period, despite our asset base increasing⁵. This result has been achieved without any material increases in failure rates. We have been able to offset the increase in the number of assets on our system with efficiencies in the way we maintain our assets to yield a long-term, sustainable maintenance spend.

This highlights how the initiatives we have undertaken have allowed us to improve the efficiency of our base year, which we have used to “roll forward” our costs in developing the maintenance forecast expenditure component of our total opex for the 2019-24 regulatory period. These significant transformation changes have enabled us to achieve a more efficient and sustainable maintenance expenditure profile moving forward.

Figure 4.2 - Overview of maintenance work (\$ millions real 2019)

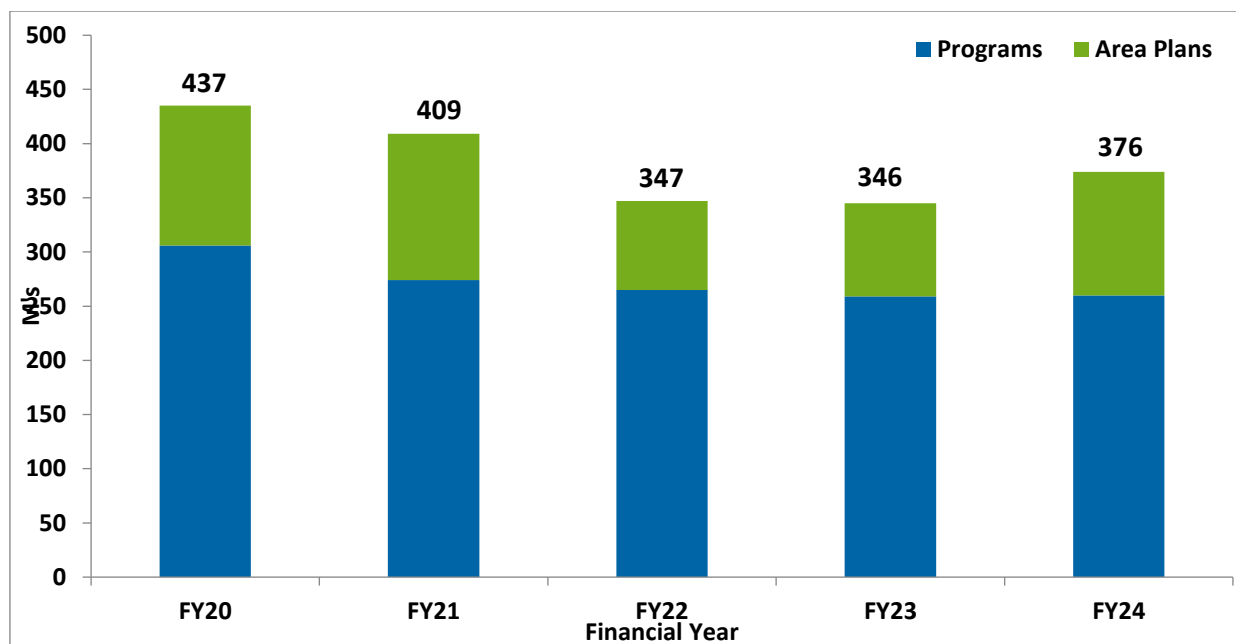


4.2.2 Network capital expenditure

Figure 4.3 illustrates the network capex profile for our 2019-24 work plan. There is an increase in the volume of network capex work from the current period, which is largely driven by an increase in replacement program related work and the need to invest more in replacement to ensure the long term sustainability and reliability of our network.

⁵ Ausgrid's asset base increased during the 2014-19 regulatory period due to growing customer connections and asset line length.

Figure 4.3 - Overview of network capex (\$ millions real 2019)



The change in capex profile from the current period will have a corresponding effect on the composition of brownfield versus greenfield projects and sub-transmission versus distribution projects. It is important from a resourcing perspective to understand these compositions, as this will influence the choice of delivery models and strategies used to optimise the delivery of the forecasted works.

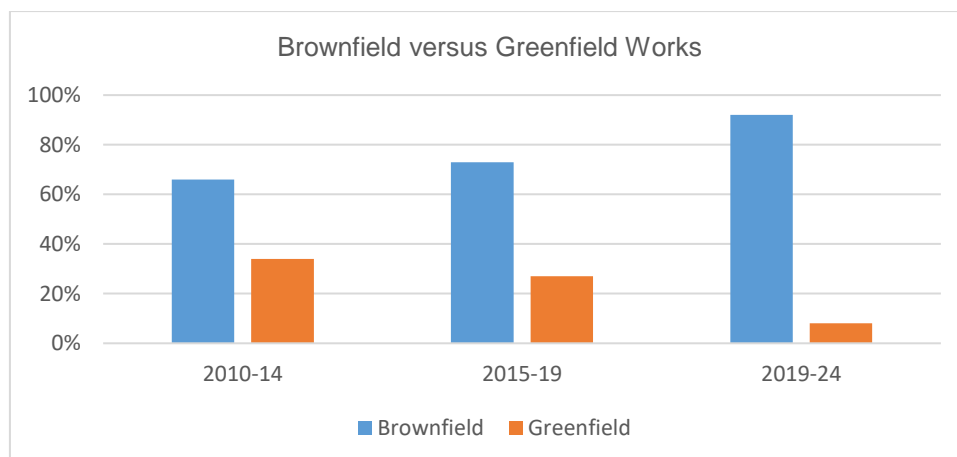
Composition of major projects versus program of works

In the 2019-24 period, there is a trend of a larger composition of capital program of works compared to major projects (Area Plans). Major projects are characterised as large one-off projects, while program of works are made up of multiple, smaller discrete sub-projects of a similar asset type. Managing multiple discrete sub-projects that are potentially spread across Ausgrid's geographical network requires greater effort in coordination, planning and effective scheduling for each sub-project. Consequently, delivering capital programs requires more resourcing effort (if measured by per FTE to expenditure delivered ratio) compared to major project work, as major project work is typically concentrated on a single location of the network (substation) or a defined route (for feeder or transmission line work).

Composition of brownfield versus greenfield work

Figure 4.4 shows how the composition between brownfield and greenfield work has changed over time on Ausgrid's network. The proportion of work on greenfield sites continues to reduce as more program of works are undertaken.

Figure 4.4 - Comparison of actual and forecast split between brownfield and greenfield sites



This change in work composition is relevant from a resourcing perspective, as it is a key determinant for assessing the appropriate delivery models for delivering the forecasted portfolio of works. This is because the complexities and risks involved in a brownfield project can differ significantly from that of a greenfield project, as highlighted by Table 4.2.

Table 4.2 - Comparison of brownfield versus greenfield work characteristics

Site Type	Level of complexity	Risk rating
Brownfield	High –requires significant planning as work is carried out on existing parts of the network, and therefore characterised by multiple network interfaces. There is a higher potential for issues to occur due to the need to manage multiple network interfaces and work within the existing constraints imposed by other parts of the network which are operational. The more network interfaces involved, the more difficult it is to clearly define the scope of works as there is a higher risk of unknown factors impacting how work is delivered and the timing of work.	High- due to potential for significant issues to occur, and for these issues to impact other parts or the network and/or other/existing customers.
Greenfield	Low – can be completed following relatively simple processes, as the work is characterised by fewer network interfaces (i.e. relatively isolated from other parts of the network), and has well defined outcomes and scope, carried out within a site without existing operational asset and energisation typically occurs at the end to connect the assets.	Low – risk is well defined, can be clearly allocated between parties, and work is unlikely to impact on other parts of the network.

Differing levels of complexity and risk will influence the delivery models/resourcing mix used for delivering the works. For example, a brownfield substation development presents a greater degree of risk and complexity than greenfield sites due to the need to manage:

- **Electrical and safety risk** – staff and contractors are undertaking work in a live operational environment, and thereby face greater safety risks than work carried out in a non-energised environment
- **Load risk** – as work is being carried out on an existing part of the network, it has multiple network interfaces that need to be managed in order to secure continuity and reliability of supply to customers, whereas greenfield work is generally carried out in isolation to the rest of the network and the work is therefore less likely to have adverse supply impacts on other customers.

To effectively manage these risks, Ausgrid may use a delivery model whereby it utilises a higher number of internal resources than typically used for greenfield sites, as this allows for a greater level of oversight into the design and construction of the work. The use of this delivery model is appropriate and prudent in such circumstances, as internal resources will be better placed than a contracted service provider to efficiently identify potential factors or issues when

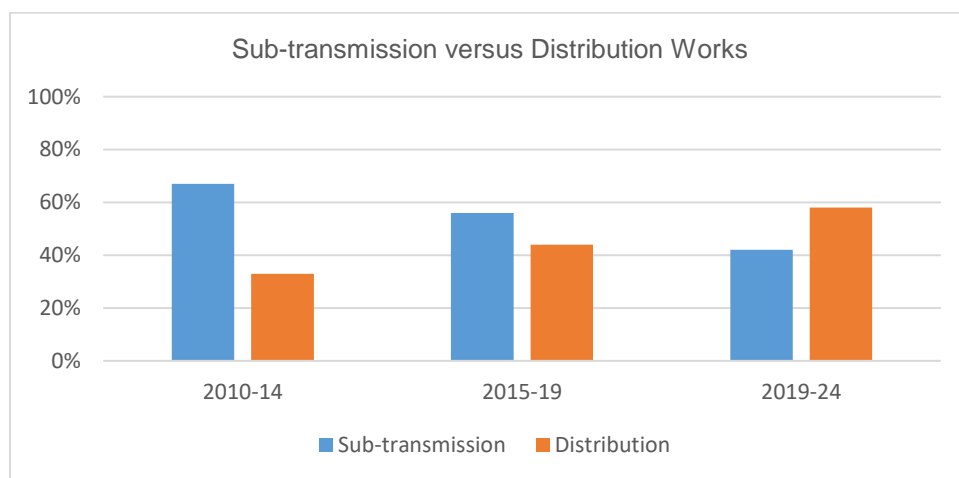
dealing with multiple network interfaces based on their expertise, familiarity with, and knowledge of, Ausgrid's network.

Further details on how differing work characteristics influence the selection of delivery models and strategies is discussed in Section 6 of this document.

Composition of sub-transmission vs distribution work

Figure 4.5 shows how the composition of sub-transmission and distribution work on Ausgrid's network has changed over time. There has been a continual trend of declining sub-transmission work and increasing work on the distribution network. The increasing trend for more work on the distribution network is being driven by the need to invest in both renewing the distribution network to ensure its sustainability and investing in the network to create platforms that enable greater levels of DER penetration and peer to peer trading.

Figure 4.5 - Comparison of actual and forecast split between sub-transmission and distribution



The changing composition of sub-transmission and distribution work influences the overarching demand for labour in terms of labour hours, duration of tasks, and demand for particular skill sets. Consequently, a key implication from the continual increase in distribution related work and overall balancing of work between distribution and sub-transmission, is the impact of demand for particular skillset, and the need to multi-skill resources to bridge the skills gap. Further details on this issue are discussed in Sections 5 and 6.

4.3 Key implications from forecast work plan

During the 2019-24 period, changes in trends with an increasing program of work compared to major projects, more distribution work and growing proportion of brownfield type work, has a corresponding impact on the demand for required skills and mix of internal / external resource to deliver the forecast work plan. In addition, the complexity and risks during delivery of these types of work are greater. The forecast work plan will require more effort in planning, scheduling and monitoring, and increased access to the network. The work plan will need to be supported by a robust end-to-end delivery process (described in Section 3) to ensure effective and efficient delivery.

5. WORK PLAN RESOURCE REQUIREMENTS

This section sets out our analysis of the resourcing requirements to support the deliverability of the proposed 2019-24 work plan. Using a Workforce Analysis Model we have quantified the labour requirements (demand) that arises from our proposed 2019-24 work plan and matched these against our existing labour resources (supply) to determine whether we have sufficient resources with the right skills at the required location to deliver our portfolio of work outlined in Section 4.

Where our analysis has revealed any shortages or surpluses in resourcing, we have developed a series of strategies (see Section 6), to mitigate the potential delivery risks posed by these resourcing gaps, and to support the overall effective and efficient delivery of our forecast work plan.

The specific topics addressed in this section include:

- An overview of the key elements underpinning our demand and supply analysis (section 5.1)
- A summary of the key findings from our analysis (section 5.2)
- A description of how findings from the workforce analysis are used to develop Ausgrid's overarching Integrated Resource Plan to support the delivery of the 2019-24 work plan (section 5.3).

5.1 Demand and supply analysis for the 2019-24 regulatory period

In determining the resourcing requirements necessary for delivering our forecasted work plan, we have examined both the demand for, and availability of, labour at a job category (skill type) and region (geographical location) level.

We have adopted this approach in order to identify whether there may be potential gaps in our existing resourcing arrangements in terms of resourcing numbers, skill sets, or location of resources versus the location of work. This analysis therefore enables us to determine whether we have the right number of resources, with the right skill sets, in the right locations across our network to deliver our proposed portfolio of work efficiently.

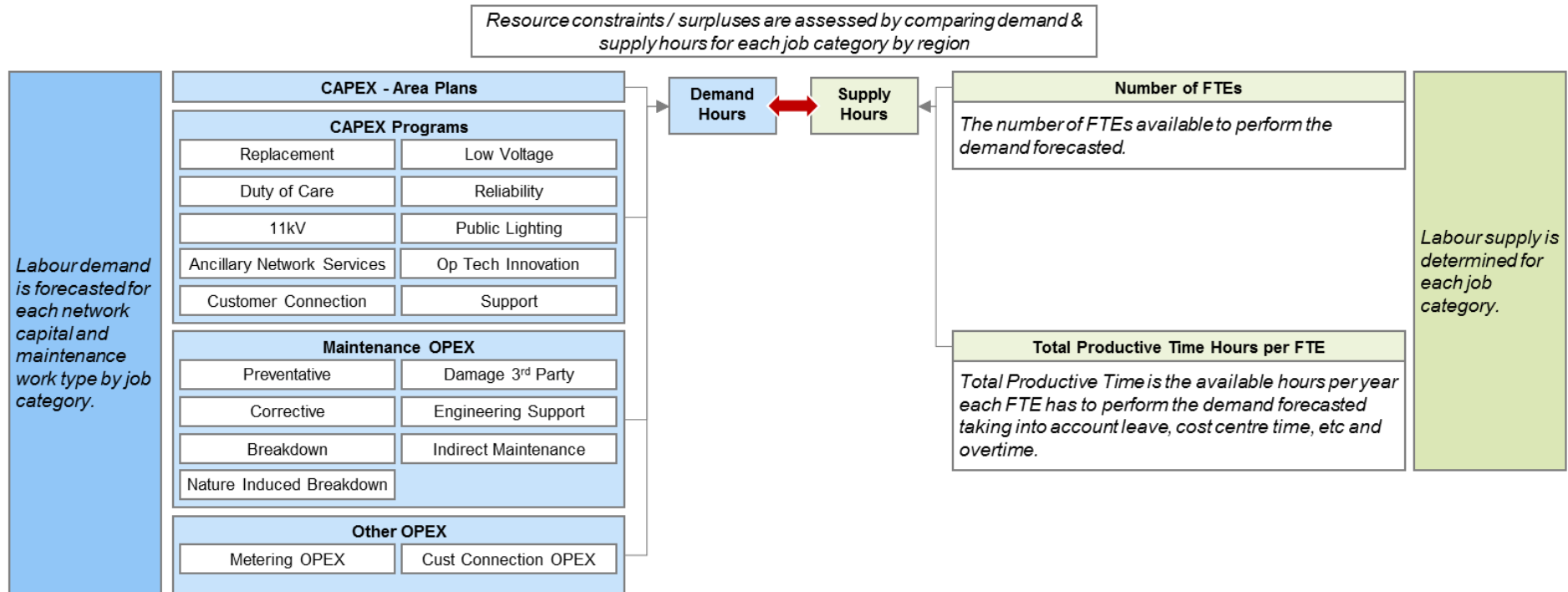
The following sections are aimed at providing a description on the analysis approach we have undertaken to arrive at the key findings outlined in Section 5.2.

5.1.1 Workforce analysis approach and methodology

Our workforce analysis is limited to the scope of activities outlined in our Integrated Works Plan. Importantly, the analysis and resulting Integrated Resource Plan is not intended to reflect the resourcing requirements for Ausgrid's total operations but rather its network activities relating to network capital, maintenance, and other network related opex. In addition, the analysis is aimed initially at forecasting the internal resourcing requirements for delivering the 2019-24 work plan, and have excluded activities which are typically delivered through contracted services (refer to Appendix A for details).

Figure 5.1 provides a high level overview of our approach in developing the Workforce Analysis Model, and also shows the scope of activities captured by our analysis. As indicated in Figure 5.1, we have taken the portfolio of work outlined in our forecast work plan and have further broken this down by work type. We have applied a forecasting approach specific to each work type to determine forecast labour hours required for each work type which is then compared against the supply of labour hours which is forecasted based on the number of available employees (measured by full time equivalent (FTE)) to perform the demand forecast by job categories. Resource constraints are then identified by comparing the demand and supply of labour hours for each job category in each region, and are then aggregated to determine whether there are any FTE shortfalls or surpluses within each job category.

Figure 5.1 - Ausgrid's workforce analysis methodology



5.1.2 Forecasting approach

Demand Forecasts

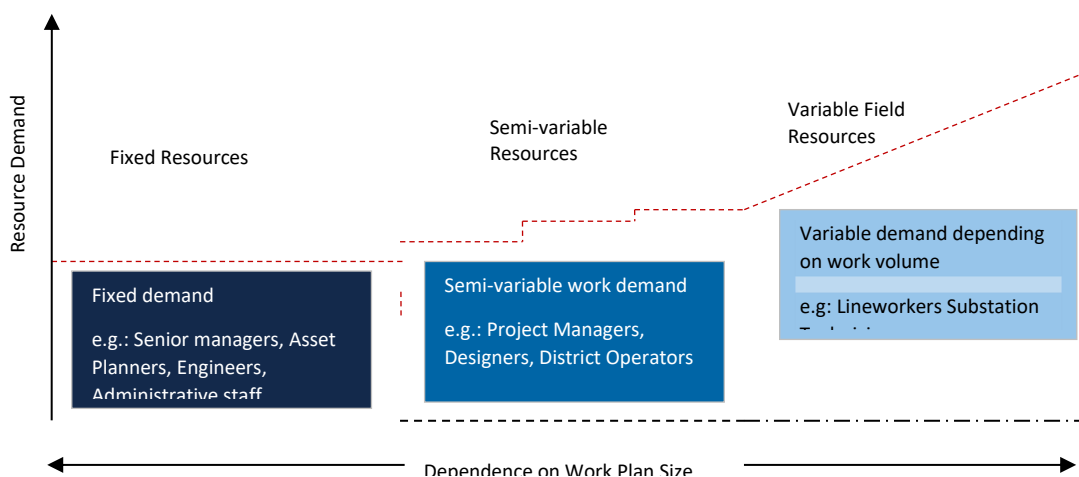
Our resource demand forecast for the 2019-24 period is a build-up of demand forecasts for each network related work type illustrated in Figure 5.1, which are based on forecasting approaches specific to that work type. Different forecasting approaches are used for different work types to reflect the differing nature of work in Ausgrid's forecast work plan, such as whether work is planned or unplanned (breakdowns, nature induced), quantity driven or task driven. Further details on the forecasting approach for each work type, and the key inputs used for forecasting demand are outlined in Appendix A.

Supply Forecasts

Our supply forecasts for the 2019-24 period is a build-up of supply forecasts for each job category that is captured within the scope of our workforce analysis.⁶ The resources involved in the planning and delivery of the work can be characterised by the extent to which the demand of their time varies according to the nature and size of the work portfolio. For the purposes of our workforce analysis, job categories are further grouped based on the nature of work undertaken. As shown by Figure 5.2, job categories can be mapped to three main resourcing types:

- **Fixed resources** – are job categories which relate to work which are not driven by project or work volumes. Resources that fall within these job categories are those that perform network capital and maintenance functions (e.g. asset planning activities, asset strategy development), or other support work that span across multiple projects rather than attributable to a specific project. Examples include senior managers, planners and administrative staff.
- **Semi-variable resources** – refers to job categories which have elements of both fixed and variable resource demand. Examples of resources captured by these job categories include project managers and designers.
- **Variable resources** – refers to job categories which involve work which is predominately booked to specific projects or activities and is highly driven by work volumes. Resources captured include those that have a clear link to specific projects or maintenance activities such as field workers.

Figure 5.2 - Resource based on variable and fixed demand



⁶ Refer to Appendix A for a list of job categories included within the scope of Ausgrid's demand-supply assessment.

For the purposes of supply forecasting, our workforce analysis does not include fixed resources and instead focuses on relevant semi-variable and variable resources. This is because resourcing requirements for these works is dependent on the volume of work. However fixed resources labour requirements are determined through level of resources required to undertake day-to-day management and operation of the network, and comply with regulatory and legislative obligations, which are established according to Ausgrid's optimal operating model design.

Further details on Ausgrid's job category structures, and grouping of resources for supply forecasting purposes are included in Appendix A.

5.1.3 Key assumptions

Table 5.1 summarises the key assumptions underlying our Workforce Analysis Model base case scenario. Further details on the forecast approach for the inputs and other assumptions are provided in Appendix A.

Table 5.1 - Summary of key assumptions

Input / Assumptions	Description
Labour Demand	Labour hours determined through the Integrated Works Plan
Supply FTEs	This is extracted from our SAP HR database, with the FTE snapshot as of 17 October 2017
Attrition Profile	The attrition profile comprise both natural attrition (that is, resignations, retirements, deceased or employees leaving due to medical conditions) and planned redundancies (including voluntary redundancies).
Labour productivity	As described in the earlier sections of this document, Ausgrid has embarked on a continuous journey of transformation and improvement. The workforce analysis has factored in the productivity improvement as described in the operating and capital expenditure chapters.
Outsourcing	Based on our outsourcing strategy to determine the split between internal and external labour required ⁷ .

5.2 Key findings

Our Workforce Analysis Model compares the forecasted demand for labour hours against the forecasted availability of labour supply to identify any resourcing gaps or surpluses, which are then aggregated to an FTE level to identify any surpluses or shortages within Ausgrid's existing pool of resources. Table 5.2 summarises the key findings from our workforce analysis.

⁷ Refer to Appendix A for details on activities assumed to be outsourced and have been excluded from the analysis.

Table 5.2 - Workforce analysis outcomes (surplus / shortage in FTEs)⁸

Job Category	Surplus / Shortage in FTEs					
	FY20	FY21	FY22	FY23	FY24	Average
Distribution Jointer	-57	-55	-57	-54	-49	-54
Distribution Lineworker	-86	-55	-63	-63	-74	-68
Distribution Technician	0	8	6	28	24	13
Customer Connection Technician	-14	-16	-17	-18	-19	-17
Transmission Jointer	-1	-8	-3	-4	-3	-4
Transmission Lineworker	-14	-15	-15	-15	-15	-15
Transmission Technician	2	1	-3	0	-2	0
Protection Technician	-6	-6	-1	6	8	0
Tele Control Technicians	7	6	5	8	8	7
Voltage Regulation Technician	1	-2	-3	1	0	-1
Electricity Supply Officer (ESO)	10	18	17	16	11	14
Electrical Engineering Officer / Engineer	-4	10	3	1	-1	2
Test & Measurement	18	16	18	18	17	17
Asset Access	-2	-3	-4	-4	0	-3
Network Data Field	-3	-4	-5	-5	-6	-5
District Operator	-23	-22	-24	-26	-27	-24
Project Manager	-29	-23	-28	-23	-10	-23
Communication Design	2	2	1	-1	1	1
Control & Protection Design	9	17	18	11	10	13
SCADA Design	-1	-1	-1	0	0	-1
Earthing & Insulation Design	6	6	6	5	5	5
Layout Design	12	10	12	8	9	10
Mains Design	6	5	6	3	5	5
Non Electrical Engineering Services	-9	-6	-3	-11	-8	-7
Total Surplus / (Shortage)	-179	-119	-134	-119	-116	-133

As indicated above, our workforce analysis has indicated that overall there is a shortfall in the number of internal resources available for delivering our forecast work plan for the 2019-24 period. The early identification of any gaps in either resourcing numbers or in particular skill sets, allows us to develop appropriate strategies aimed at bridging this gap - either through strategies targeted at improving cross regional sharing of resources where cost efficient, or strategies which aim to improve the flexibility of Ausgrid's workforce delivery practices.

To the extent that our analysis has revealed surpluses in particular skill sets which cannot be managed through multi-skilling, these surpluses will be managed through attrition, voluntary redundancies, or redeployments to other parts of the business where there is a need and a match in corresponding skill sets.

Further details on the strategies that Ausgrid will be using to address gaps identified with our current resourcing arrangements are discussed in more detail in Section 6.

⁸ Positive numbers in the table indicate a surplus in resources, while negative numbers indicate a shortage in resources.

6. RESOURCE & DELIVERY STRATEGIES

This section outlines the key resourcing and delivery strategies that support the effective and efficient delivery of our forecast work plan for the 2019-24 period. In particular, this section describes the overarching strategic considerations that guide our decision making, in selecting the delivery model and resourcing strategies for delivering projects and programs of work.

In addition, this section discusses the key implications from our workforce analysis, and the mix of resourcing and delivery strategies that will be used to optimise the delivery of our forecast work.

6.1 Strategic considerations

In determining the appropriate resource and delivery model strategy that should be used to support the delivery of different programs and projects of work, we consider a number of strategic factors. The key strategic factors we have regard to, as part of our decision making process, are outlined in Table 6.1.

Table 6.1 Strategic considerations

- | | |
|--|---|
| <ul style="list-style-type: none">• Internal capability and expertise in operational and incident management• Complexity of project and risk to the network• Available market capability and ability to flexibly and efficiently respond to changes in forecast work and plan across regions• Ausgrid's transition from expert practitioner to 'informed client'• Innovation in design and implementation approach | <ul style="list-style-type: none">• Strategic intention to retain core expert competencies• Safety, electrical and network risks including security and reliability of supply to customers• Ausgrid's maturity and capability in design and asset specifications, procurement, contract management and project management• Safety and network access regimes to support external delivery⁹• Commercial value |
|--|---|

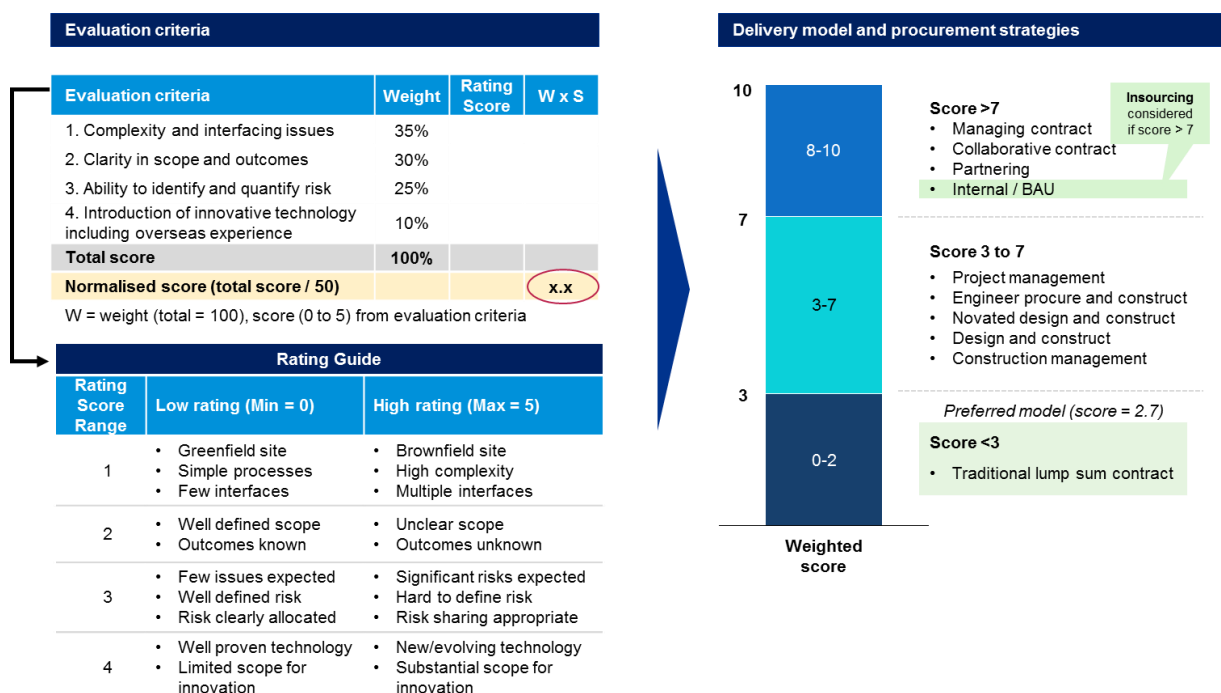
The above considerations are intended to provide overarching guidance in the selection of resourcing and delivery strategies, so that the optimal mix of strategies are employed to promote the achievement of Ausgrid's business goals and objectives. The strategic considerations are aimed at promoting the delivery of work in a manner which is both prudent and efficient, and provides value to our customers.

6.1.1 Delivery model selection framework

Ausgrid has a clearly defined process for identifying and assessing suitable projects and/or programs of work for outsourcing. Our delivery model assessment framework, illustrated by Figure 6.1, provides a structured process for assessing the project/program risk profile, and matches this to the delivery model that is most appropriate in light of the identified project/program of risks and represents the best value for money.

⁹ An example of this is substation access and training of external contractors.

Figure 6.1 - Evaluation criteria and delivery model strategy selection framework



As shown in Figure 6.1 there are four key evaluation criteria used for determining the suitability of projects and programs for various delivery strategies. These include:

- Complexity and interfacing issues
- Clarity in scope and outcomes
- Ability to identify and quantify risks
- Innovation and overseas experience.

A weighted score is given to each of the criteria based on a rating from 0-5, which is assigned based on the consideration of key factors, to arrive at a total score. In general, projects/programs with a low risk rating score are more appropriate delivered via outsourcing, whereas a project/program with a high risk rating score will generally be delivered via insourcing, or a combination of insourcing and outsourcing, to mitigate Ausgrid's risk exposure while still achieving commercial value for our customers.

The delivery assessment model framework provides a standardised approach for management in guiding the selection of the optimal delivery model for a project/program in light of its risks. The framework has been successfully applied in the current regulatory period, and will continue to be applied in the forthcoming period.

6.2 Workforce strategies

Changes to the composition of work from the current period drives corresponding changes in the demand for particular skill types. As illustrated by our workforce analysis in Section 5.2, the changing composition of Ausgrid's work has created an overall shortage in resources, as well as shortages in a number of key skill sets required for delivering the work plan such as distribution jointers, lineworkers, distribution operators, and customer connection technicians.

Ausgrid has proactively sought to identify gaps in our resourcing arrangements to enable the development of appropriate strategies for mitigating delivery risks associated with having either:

- **Too few resources or insufficient resources with the right skill sets** – this may impact upon Ausgrid’s capability and capacity to deliver the work outlined in its work plan
- **Too many resources or surpluses in skill sets** – this may undermine the effectiveness in which work is delivered by causing an under-utilisation of resources.

We have developed a range of strategies for effectively managing the skill shortages and the overall shortage in our resourcing. Any identified surpluses will be managed via Ausgrid’s existing business-as-usual (BAU) workforce strategies which have been effective over the last three years. In selecting appropriate workforce strategies to support the effective delivery of work, Ausgrid has regard to the strategic considerations outlined in Section 6.1, which are intended to drive efficient outcomes in our decision making and operations.

Further details on the different strategies used to improve our internal workforce productivity and capabilities are described in more detail in the following sections.

6.2.1 Strategies for addressing skillset and resource shortages

Our workforce analysis in Section 5.2 highlighted a number of demand and supply imbalances in certain skill sets, which is being driven by the increased need for replacement work on Ausgrid’s distribution network and the increased volume of certain types of work. Table 6.2 summarises some of the key shortages in skill sets identified by our workforce analysis, and the associated driver for the shortage.

Table 6.2 - Overview of key shortages caused by changes to work plan composition

Skills set	Driver
Distribution jointers and lineworkers	Key capital programs such as: <ul style="list-style-type: none"> • Replacement of low voltage underground mains; • Replacement of CONSAC mains; • 11kV network reinforcement program; • Steel main replacement programs; and • Low voltage circuit reconfiguration (duty of care) program.
Transmission lineworkers	Pole replacement program and refurbishment of 33 kV overhead feeders
Customer connection technicians	Low voltage overhead service program
District operators	Overall volume of work forecasted under the 2019-24 work plan and increase in brownfield work creates an increased demand for district operators which are required to provide access to the network so that work can be performed.
Project Managers	Area plans (major projects) and other large key programs of work

To mitigate the risk of having insufficient capacity or capability to deliver the work outlined in our forecast work plan, we have developed a range of workforce strategies aimed at managing the demand/supply imbalance created by changes to the work composition. Table 6.3 provides an overview of the strategies we have developed to re-balance the demand supply.

Table 6.3 - Strategies for addressing skill shortages

Strategy	Description
Multi-skilling and cross regional utilisation	Skilling up resources where there is additional capacity to undertake tasks where there is a skill shortage. Additionally, regions with excess capacity of particular skillsets can be deployed to regions with shortage, where it is cost efficient to do so.
Overtime	Use overtime by actively monitoring and managing overtime levels completed by employees in critical skills with shortages.
Productivity improvement	<ul style="list-style-type: none"> • Improve work practices to increase productivity of labour • Increase capacity of resources by reducing cost centre time • Improved labour productivity and efficiency through works coordination and technology.
Recruitment and training in critical skilled resource areas	<ul style="list-style-type: none"> • Utilise internal recruitment teams to attract internal / external candidates to roles identified as being crucial to BAU. • Training / apprenticeship programs.
Fixed term employees	To fill in gaps where peaks in demand will not be sustained in the long term (e.g. 2 year fixed term role).
External contractors / labour hire plans	<ul style="list-style-type: none"> • Utilise a mix of additional labour hire and contractors to meet other peak overflow demands • Project based/fixed term programs where long term requirement is not identified • Leverage on existing panel contracts or period contracts to access external resources.

It is important to note that addressing demand supply imbalances may require the use of a combination of strategies outlined in Table 6.3. For example, the shortage of distribution jointers identified in the workforce analysis can be mitigated by outsourcing the jointing work under Ausgrid's existing Contract Cable Laying panel. Additionally, there is potential for multi-skilling of particular jointing tasks that can be carried out by Distribution Technicians, which has been identified as having excess capacity. The appropriate delivery strategy will be assessed and balanced across the commercial, risks and strategic business factors.

6.2.2 Strategies for managing surpluses

In addition to identifying shortages in some skill sets, our workforce analysis also revealed the existence of surpluses in certain skill sets. Skill sets with notable surpluses identified by our analysis include distribution technicians, electricity supply officers (ESO) and tele control technicians.¹⁰

Identified skill set surpluses which cannot be managed by multi-skilling, will be managed through Ausgrid's business-as-usual workforce strategies, which are described in the Table 6.4. These strategies are primarily focused on managing and maintaining an efficient workforce base and improving the utilisation of existing resources.

¹⁰ Refer to key findings from workforce analysis outlined in section 5.2.

Table 6.4 - Strategies for addressing surpluses / reducing workforce

Strategy	Description
Redeployment	Redeployment opportunities offered for employees wishing to remain at Ausgrid. Where suitable, employees can be trained to fill in gaps in skills where there are shortages.
Voluntary redundancy	Employee whose role has been identified as a surplus to business requirements and the employee chooses to leave the organisation. Offer voluntary redundancies to employees we no longer need. Ausgrid has established a Career Transition Centre (CTC) to assist redundant employees increase their skills and find work elsewhere. This will reduce cost over the longer time, even though there is an initial increase in costs due to redundancy payments in line with obligations under the Enterprise Bargaining Agreement (EBA) with our employees.
No replacement of attrition	No recruitment process to replace staff who exit the organisation through resignation or retirement
Mandatory redundancy – contract staff	A mandatory redundancy of an excess contract employee under the provisions of their employment contract
Introduction of mandatory redundancy for agreement based staff	Amendment of industrial instruments to provide for the mandatory redundancy of agreement based staff
Reduction in Trainee and Apprenticeship Scheme	Reduction in numbers of approved apprenticeships across specific trades and locations
Contractors / labour hire plans	Reduction in labour hire where work demands reduce / utilise surplus employees rather than external contractors / labour hire
Fixed term staff roll-offs and redundancy	Non-renewal of fixed term staff through non-renewal or redundancy

6.3 Outsourcing strategies

We use outsourcing to manage shortfalls in resourcing, and to deliver projects and/or programs of work where it has been identified as the most prudent and efficient means for delivering the work, in accordance with Ausgrid's delivery model assessment framework and strategic considerations.

We already outsource a significant portion of its network related activities. In 2016/17, we outsourced approximately 40% of the total direct network capital, maintenance and other network operational expenditure to contracted services. This includes a number of major projects that have been delivered under a design and construct arrangement. The delivery method for those projects and activities have been identified as the most efficient means for delivering the work; or alternatively, it has been determined that internal staff lacked the capability and capacity to deliver the work.

To allow Ausgrid to outsource in an efficient and effective manner, we have established procurement strategies and contracting arrangements in place. For instance, as part of our procurement strategy and process, we continuously undertake:

- Ongoing reviews of overall work demand and resource requirements, and identifying where ramping up and down of external resources are required as work demand changes
- Review of key performance measures that are outcomes based with appropriate incentives in place
- Improving bundling or packaging of work so that it is more cost efficient for the overall project and reduces interface risk

- Streamlining contracting arrangements to improve the efficiency in contract management and better manage business risks
- Establishing long term strategic partnerships where there is commercial benefit to do so
- Providing medium to longer term visibility of work in the pipeline to enable contractors to plan their resources.

Our strategies and processes are aimed at providing us with the ability to flexibly obtain external resources quickly, at efficient market prices, and at a quality that meets Ausgrid's standards. We will continue using external resources to meet peak demand and deliver components of the work plan where it is more efficient to do so.

Our previous request for information and tender processes, have indicated that the external market has sufficient capability to deliver the required skills and resources over the next regulatory period to support the delivery of our work plan. The procurement of these services is supported by our established processes, which are aimed at identifying delivery partners that can deliver more innovative services to customers at affordable prices.

6.3.1 Contracting arrangements

Ausgrid applies various types of contractual arrangements depending on various factors including the work type, work volumes over a period of time and available market providers. The contractual arrangements have flexibility built in to allow ramping up or down of external resources depending on the work plan.

On an ongoing basis, there are activities where Ausgrid has limited or no capability, are outsourced under standard period contracts, as indicated in Table 6.5.

Table 6.5 - Summary of key activities mostly or fully outsourced

Capital	Maintenance	Other Network Operational Activities
Project services such as traffic management, environmental and community consultation Tower refurbishment	Pole and line inspections Vegetation management Fire equipment and services inspection and maintenance	Public lighting – bulk lamp replacement

To support large program of works where external support is required, Ausgrid has also established panel contracts with a number of providers selected through a competitive tender process. Panel contracts have pre-negotiated terms and conditions, and pricing approach that allow for easier and quicker access to external resources, thereby reducing delivery timeframes. Table 6.60 summarises some of the key panel contracts that Ausgrid currently has in place.

Table 6.6 - Ausgrid panel agreements

Panel Type	Description
Contract cable laying	This panel consists of three companies which provide coverage across Sydney South, East and North; as well as Central Coast and Hunter regions. Cable laying activities are fully outsourced to the panel of contractors.
Inside substation and civil works	The works include security perimeter and internal upgrades, oil containment, switchgear and feeder replacement, building restoration, demolition and civil works.
Reinstatement services (in progress)	This arrangement covers permanent reinstatement services after replacing or installing underground cable. Ausgrid works with local councils and Roads and Maritime Services (RMS) preferred contractors to complete reinstatement works.

The panel contracts have provided Ausgrid with the ability to secure better pricing due to economies of scale and greater certainty of work to contractors. We benefit by having the ability to access required service more quickly rather than go to the full procurement exercise each time (improving efficiency in the procurement process) particularly for services or materials that we procure regularly.

Given Ausgrid's experience in managing peaks and troughs of work demand over the last 10 years, we have partnered and worked with external service providers to build the required skills and a competitive market to complement our internal delivery capability.

6.4 Impact of Ausgrid's Enterprise Bargaining Agreement

Ausgrid's Enterprise Bargaining Agreement (EBA) has implications upon how quickly Ausgrid can ramp down its workforce to reflect changes in work volumes, and how quickly it can approach the market for the provision of contracted services. Despite the EBA imposing some timing restrictions, Ausgrid has been able to successfully work within the constructs of its industrial relations framework to effectively manage its workforce and flexibly deliver work.

Further details on how Ausgrid works within the constraints of its EBA to deliver value to our customers are outlined below in the following sections.

6.4.1 Achieving delivery flexibility under the EBA

Under the EBA we are required to undertake consultation prior to outsourcing specific work. Specifically, clauses 5 and 6 of the EBA requires Ausgrid to consult with the unions prior to testing the market for the provision of contracted services.

While consultation requirements under the EBA place some limitations on how quickly Ausgrid can move to test the market for outsourcing services, this has not created an impediment to, or constrained, the use of outsourcing by Ausgrid. Rather, Ausgrid has worked collaboratively with the unions to consult on projects identified as suitable for outsourcing. We have worked hard to streamline our consultation process with the unions and to build the unions' familiarity with the type and scope of projects suitable for delivery via outsourcing, or a combination of outsourcing and internal resources.

The implementation of our transparent delivery model assessment framework allows us to identify projects which may be suitable for outsourcing and to commence union consultation on these projects earlier in our planning process. Over time, we have been able to refine and standardise our consultation approach with the unions, so that consultation is undertaken on tranches of projects rather than on an ad hoc basis. This, in combination with the unions building greater familiarity with the type and scope of projects, has enabled Ausgrid to significantly condense consultation timeframes.

Further details on the projects we have consulted with the unions on and the timeframes in which consultation has been able to be successfully completed are outlined in Appendix D.

6.5 De-risking the delivery of the 2019-24 work plan

As outlined above, we have a range of delivery, workforce, and outsourcing strategies to support the effective and efficient delivery of our forecast work plan. These strategies are aimed at supporting the delivery of the work plan by:

- Mitigating delivery risks associated with delays in project lead times and/or project completion caused by design constraints, procurement lead times, poor work scheduling, or skill set shortages
- Ensuring that the best value for money delivery options are selected having regard to the project/program risks and Ausgrid's risk tolerance level
- Promoting greater alignment between Ausgrid's resources and the volume of work required to be delivered, as well as increased flexibility in how work is delivered.

While the key findings from our workforce analysis indicated that we have an overall shortage in our baseline workforce, and supply/demand imbalances in particular skill sets, we have developed a series of strategies for correcting the identified supply/demand imbalances caused by changes to our work plan composition.¹¹ In particular, these strategies are aimed at ensuring that we have the right resources, with the right skill sets, in the areas where work is required to be delivered.

Where outsourcing has been identified as the most efficient option for addressing resourcing shortages or delivering work, we have prudent contract and procurement arrangements in place to allow it to quickly source contracted services at efficient market rates. We have further established processes to reduce consultation lead times on outsourcing.

Together, the strategies outlined in this section represent the multiple levers available to Ausgrid to correct resourcing and skill set imbalances, and to effectively mitigate delivery risks. In selecting the optimal combinations of strategies, Ausgrid has confidence in its ability to deliver the proposed 2019-24 work plan efficiently and effectively.

¹¹ See section 6.2 for further details.

APPENDIX A: FORECAST APPROACH

A1. Forecast Labour Demand

Table A1 to Table A3 set out the scope of activities addressed by our workforce analysis to determine the resourcing requirement to deliver our forecast work plan. The activities described in Table A1 to Table A3 reflect the core activities required to deliver the portfolio of works that make up our forecast 2019-24 work plan, outlined in section 4.

Ausgrid uses several approaches and tools for forecasting labour requirements for the network capital and maintenance work. The most appropriate technique and tool for each type of work is chosen. A description of the forecast approach for each work type is also described by Table A1 to Table A3.

A2. Split between internal & external labour

The work carried out by external providers / contractors is based on Ausgrid's current delivery approach.

1. The following work where there is limited or no internal expertise, are assumed to be fully outsourced in the demand analysis:

Capital	Maintenance	Other Network Operational Activities
<ul style="list-style-type: none">• Civil and building services• Contract cable laying• Project services such as environmental and community consultation• Tower refurbishment	<ul style="list-style-type: none">• Pole and line inspections• Vegetation management• Fire equipment and services inspection and maintenance	<ul style="list-style-type: none">• Public lighting – bulk lamp replacement

2. In addition to the above, a proportion of the capital programs and maintenance are assumed to be outsourced, and are detailed below:

Capital programs	Public lighting opex
<ul style="list-style-type: none">• Pole replacement program at 20% based on historical trends;• Consac program at 50% for jointing activities	<ul style="list-style-type: none">• Approximately 40% of activities are assumed to be outsourced, consistent with historical trends.

Table A1 - Network capital portfolio

Program	Type of Program	Description	Forecast approach
Network Capital – Area Plans	Area Plans	Investment on the sub-transmission network to : <ul style="list-style-type: none"> • Replace major assets to maintain safety of the network • Increase the capacity on the network (to meet demand and maintain security, reliability and quality of supply). 	Based on unit rate and quantity estimates templates in Primavera.
Network Capital – Programs	Replacement	Replacement of degraded distribution network assets and smaller piecemeal replacement of sub-transmission assets not covered by the area plans, to maintain the safety and performance of the network.	Based on unit rate and quantity estimate templates in SAP BPC and Primavera for planned programs, and extrapolation of historical direct hours booked and forward estimates for reactive programs.
	Duty of Care	Compliance and management of risk related to safety, environment and infrastructure security.	Based on unit rate and quantity estimate templates in SAP BPC and Primavera for planned programs, and extrapolation of historical direct hours booked and forward estimates for reactive programs.
	High Voltage & Low Voltage capacity	Investment to increase capacity on elements of the HV and LV network to meet demand, and to maintain security, reliability and quality of supply. Also includes investment required to meet reliability performance standards.	Based on unit rate and quantity estimate templates in SAP BPC and Primavera for planned programs, and extrapolation of historical direct hours booked and forward estimates for reactive programs.
	Customer Connections and Ancillary Services	Obligations relating to customer connections, supply augmentation and customer specific standards of service.	Based on historical review of expenditure and factors such as changes in demand and changes in customer connection activities.
	Public Lighting	Replacement of degraded assets and provision of new public lighting.	Based on bottom up build of resources required for each capital task provided in-house for public lighting work proposed.
	Support	Strategic network planning, system control and GIS operations. Acquisition of strategic system property and easements and land remediation.	Based on historical review of labour demand and current operating model.
	Operational Technology Innovation	Infrastructure, platforms, applications and devices required to support our network.	Based on bottom up build of expenditure and resources.

Table A2 - Core network maintenance

Program	Type of Program	Description	Forecast approach
Core Network Maintenance	Planned Corrective Fault and Emergency Nature Induced Breakdown	Preventative or planned maintenance, inspections, condition based maintenance and reactive work to address faults and emergencies. Include PMO 1 to 4. Covers the following asset types: <ul style="list-style-type: none"> • Transmission substations • Zone substations • Distribution Substations • Transmission Mains • Distribution Mains • Public Lighting 	Preventative maintenance – based on planned annual maintenance task volumes multiplied by historical average time per task obtained from entries of work orders in SAP, using template in Primavera. All other maintenance – based on actual results obtained from all entries of work orders in SAP, utilising templates in Primavera.
Other Network Maintenance & Engineering Support	Repairs due to damage by third party Other (Non-direct maintenance and Engineering support)	Include PMO 5, 8 and 9	All other maintenance – based on actual results obtained from all entries of work orders in SAP, utilising templates in Primavera.

Table A3 - Other network related operational activities

Program	Type of Program	Description	Forecast approach
Customer connection OPEX	Support for customer connection enquiries and applications	Administrative support for customer connections and notifications.	Based on historical review of expenditure and factors such as changes in demand and changes in customer connection activities.

A3. Forecast Supply

All of Ausgrid's employees are classified into job families and job categories.

Job families are high level groupings, typically focussing on a common feature that distinguish them from other functions. There is a further breakdown into job categories which aligns to job families. Similarly, the job category classified focusses on common features to differentiate them from others. The job categories are used in the workforce analysis to identify skill shortages and surpluses over the period.

While there are many job categories within each job family, our analysis is limited to job categories related to the network activities that make up our work plan and if the activities they undertake are dependent on the size of the work plan.

The job categories included in our workforce analysis and by our Integrated Resource Plan are outlined in the table below.

Job Family	Job Category		
Management / Professional	<ul style="list-style-type: none"> Project Manager 	<ul style="list-style-type: none"> Electrical Engineering Officer / Engineer 	
Base Field	<ul style="list-style-type: none"> Distribution Jointer Distribution Lineworker Distribution Technician Customer Connection Technician Electricity Supply Officer (ESO) 	<ul style="list-style-type: none"> Transmission Jointer Transmission Lineworker Transmission Technician Asset Access Compliance Inspector 	<ul style="list-style-type: none"> Network Data Field LV Services Metering Operation Technician Risk Mitigation Technician
Advanced Field	<ul style="list-style-type: none"> District Operator Protection Technician 	<ul style="list-style-type: none"> Tele Control Technicians Voltage Regulation Technician 	
Engineering	<ul style="list-style-type: none"> Communication Design Control & Protection Design SCADA Design 	<ul style="list-style-type: none"> Layout Design Mains Design Earthing & Insulation Design 	<ul style="list-style-type: none"> Network Operations Design Non Electrical Engineering Services

APPENDIX B: DEMAND ANALYSIS

B1. Resource Demand by Work Type (in man-hours)

Work Type	FY20	FY21	FY22	FY23	FY24
Capital Programs	1,618,651	1,461,320	1,448,432	1,421,009	1,398,392
Area Plans	297,770	279,132	248,945	188,180	154,387
Maintenance OPEX	456,449	456,449	456,449	456,449	456,449
Other Network Operational Activities	91,201	90,543	90,452	89,426	86,442

B2. Resource Demand by Job Category (in FTE's)

Job Category	FY20	FY21	FY22	FY23	FY24
Distribution Jointer	142	137	136	131	124
Distribution Lineworker	398	358	356	348	351
Distribution Technician	206	192	188	160	158
Customer Connection Technician	57	57	57	57	57
Transmission Jointer	22	28	22	23	21
Transmission Lineworker	29	29	29	28	28
Transmission Technician	7	8	11	9	10
Protection Technician	67	66	58	50	46
Tele Control Technicians	17	18	18	14	14
Voltage Regulation Technician	16	19	20	15	16
Electricity Supply Officer (ESO)	97	85	84	81	83
Electrical Engineering Officer / Engineer	254	232	232	227	223
Test & Measurement	15	16	13	12	12
Asset Access	23	23	23	23	18
Network Data Field	22	22	22	22	22
District Operator	130	126	124	123	121
Project Manager	79	72	76	68	55
Communication Design	2	8	8	9	9
Control & Protection Design	30	15	13	19	20
SCADA Design	3	3	3	2	2
Earthing & Insulation Design	8	8	8	8	8
Layout Design	8	9	7	11	9
Mains Design	3	4	3	6	3
Non Electrical Engineering Services	42	38	34	41	37

APPENDIX C: SUPPLY ANALYSIS

C1. Supply FTE by Job Category

Job Category	FY20	FY21	FY22	FY23	FY24
Distribution Jointer	84	82	79	77	75
Distribution Lineworker	312	303	294	285	276
Distribution Technician	206	200	194	188	182
Customer Connection Technician	43	41	40	39	38
Transmission Jointer	20	20	19	19	18
Transmission Lineworker	15	14	14	13	13
Transmission Technician	9	9	9	8	8
Protection Technician	61	59	57	56	54
Tele Control Technicians	24	24	23	22	21
Voltage Regulation Technician	17	17	16	16	15
Electricity Supply Officer (ESO)	107	103	100	97	94
Electrical Engineering Officer / Engineer	250	243	235	228	221
Test & Measurement	33	32	31	30	29
Asset Access	20	20	19	19	18
Network Data Field	18	18	17	17	16
District Operator	107	103	100	97	94
Project Manager	50	49	47	46	44
Communication Design	4	4	4	4	3
Control & Protection Design	31	30	29	28	28
SCADA Design	2	2	2	2	2
Earthing & Insulation Design	15	14	14	13	13
Layout Design	20	19	19	18	18
Mains Design	10	9	9	9	9
Non Electrical Engineering Services	33	32	31	30	29

C2. FTE supply calculation & assumptions

Available time

The available supply FTE time is calculated as shown in the table below.

FTE Calculation Assumptions		
Calculation of Available Hours per FTE		Hours
Total Standard Working Hours		
Working weeks (based on 365 days)	52.1 weeks	
Standard hours per week	36 hours	
Total standard working hours per year	Working weeks x standard hours	1,877.1
Less: Average Leave Hours		
Annual leave weeks taken per annum	4 weeks	
Sick leave weeks taken per annum	1 week	
Total leave weeks taken per annum	5 weeks	
Total standard leave hours per year	Total leave weeks x standard hours	-180.0
Less: Other Holiday Leave		
Public holidays per annum	9 days	
Ausgrid picnic day	1 picnic day	
Half day concession	0.5 days	
Total other holiday leave days	10.5 days	
Total other holiday leave hour per year	Total other holiday leave days x 7.2 hr. per day	-75.6
Total available hour per FTE		1,621.5

Productive time and utilisation

For all the job categories assessed in the Integrated Resource Plan, the labour utilisation rate of 80% is applied. This is based on the assessment of the historical average utilisation and time charged to the network activities for the job categories assessed.

Overtime

We have estimated available supply of overtime based on the overtime hours charged in 2016-17. On average this is approximately 8% of available time for the network resources.

Attrition

We have assumed an attrition profile of 0% per annum in the next regulatory period in the assessment of the resourcing and delivery strategy.

APPENDIX D: EBA CONSULTATION PROCESS

Summarised below are the projects consulted under Ausgrid's EBA, and the timeframes in which consultation was completed and an outcome determined by Ausgrid.

Tranche 0 projects

New Munmorah & Alexandria Sub-transmission Substations were the first projects delivered via a Design & Construct arrangement. Consultation commenced 25 June 2014 and concluded on or about 1 July 2015. Total consultation time taken was 13 months.

Tranche 1 projects

Outlined below are the projects that were consulted on with the unions during November 2015 to March 2016. The total time to complete consultation was 5 months.

Project	Project type
Strathfield South 132/11kV Zone substation and associated 132kV feeders	Greenfield substation
Rockdale 132/11kV Zone substation	Greenfield substation
Cessnock 33/11kV Zone substation	Greenfield substation
Tighes Hill 33/11kV Zone	Greenfield Substation
Singleton 11kV Switchgear Replacement	Some greenfield scope in operational site
Branxton 11kV Switchgear Replacement	Some greenfield scope in operational site
Homebush to Top Ryde 132kV UG Feeders	Greenfield Feeder
Canterbury to Summer Hill 33kV Feeders	Greenfield Feeder

Tranche 2 projects

Outlined below are the projects that were consulted on with the unions during May 2016 to July 2016. The total time to complete consultation was 2 months.

Project	Project type
Greenacre Park 132/11kV Zone	Greenfield Substation
Peakhurst STS 33kV Refurbishment	Some Greenfield Scope in complex brownfield operational site
Summer Hill 33/11kV Zone	Greenfield Substation with some site brownfield constraints
Lidcombe 11kV Switchgear Replacement	Complex brownfield operational site
Waratah STS Busbar Refurbishment	Complex brownfield operational site
Matraville 11kV Switchgear Replacement	Complex brownfield operational site
Botany 11kV Switchgear Replacement	Some Greenfield Scope in complex brownfield operational site
Myuna and Cooranbong 11kV Switchgear Replacement	Complex brownfield operational site
Newdell 11kV Switchgear Replacement	Complex brownfield operational site
92JA/B and 92GA/B 132kV Feeder Replacement	Greenfield Feeder
Sydney Airport 33kV Feeder Replacement	Greenfield Feeder
Mascot 33kV Feeder Replacement	Greenfield Feeder