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1 Introduction

1.1 Purpose

The purpose of this document is to provide information in relation to information requested in Schedule 1 of the Regulatory Information Notice (RIN) for the forecast period 1 July 2021 to 30 June 2026.

Most of the information requested in Schedule 1 is included in AusNet Services' submission, the appendices to the submission, or in supporting documentation. Information is included in this document where the submission, the appendices to the submission, or the supporting documentation does not provide the information requested in Schedule 1.

1.2 Structure

This document provides information referenced to the numbering in Schedule 1 of the RIN.

2 Replacement Capital Expenditure Modelling

RIN Reference	Commentary
4.4	Over previous regulatory periods AusNet Services has demonstrated its ability to deliver multiple programs of asst replacement and construction with various rates of activity. AusNet Services manages the scheduling of work to optimise use of resources and mitigate the effects of fluctuations in workload. Large programs such as the REFCL installation program are delivered across multiple years and regulatory periods which mitigates risks to deliverability.
4.5 (b) (i)	It is assumed that 40% of HV and LV AUGEX, expenditure for HV Feeders – Land Purchases and Easements, and \$152.2m of REFCL Augmentation expenditure is greenfield driven. The balance of AUGEX is considered to be reinforcement driven augmentation capex.
4.5 (b) (iii)	Replacement of assets to due condition are considered to be REPEX. Replacement of assets due to changes in network use or regulations are considered to be augmentation capex.
4.5 (b) (iv)	Installation of fall arrest systems is a safety driven program and does not clearly fall within the definitions of either REPEX augmentation capex. However, they have been recorded under AUGEX as they are installed for the purpose of monitoring and maintaining the condition of HV Lines.
5.1(a)(i)(A)	Data in template 2.2 has been provided in the asset categories defined in Appendix F of the RIN with the exception of the following categories.
	POLE TOP STRUCTURES
	These are horizontally oriented structures and their components that provide support for overhead conductors and related assets to be supported on a pole and provide adequate clearances. This relates to expenditure incurred when a pole top structure is

replaced independently of the pole it is located on. This includes cross-arms and insulators that are replaced with the cross-arm. It excludes any pole mounted assets that are included in any other asset group, notably pole mounted substations and pole mounted switchgear such as links, fuses, air break switches etc.

It excludes insulators that are replaced individually or as a program where the cross-arm is not replaced. These insulators are reported in the OTHER - INSULATORS category.

OVERHEAD CONDUCTORS – OTHER

This category includes insulated cable systems such as Aerial Bundled Cable as distinct from bare, uninsulated conductors.

OTHER – INSULATORS

Insulators have been separated out from the Crossarms and Pole top structures categories. They include cycloaliphatic, polymeric, glass and porcelain structures which electrically separate conductors from other assets. Further detail of these assets is provided in the asset strategy ASD - AMS 20-66 Insulators – High and Medium Voltage.

OTHER - SITE REPAIRS

The site repairs category covers civil infrastructure including buildings, environmental systems, security fence and overall switchyard including switchyard surface, access roads, stations lights, cable ducts and trenches, signage and name plates, support structures and foundations that all contribute to the overall function of the stations. This category only includes zone substation and voltage regulator sites.

OTHER – SWITCHBOARDS

Modular units comprising 4 to 8 circuit breakers installed in switch rooms. Further detail of these assets is provided in the asset strategy ASD - AMS 20-56 Indoor Switchboards.

OTHER - VOLTAGE TRANSFORMERS

Voltage transformers (VTs) measure the operating voltage of a high voltage electricity circuit and transform this measurement into convenient voltages for use in protection and control relays. VTs consist of Capacitive Voltage Transformers (CVT) and Magnetic Voltage Transformers (MVT) (single and three-phase). Voltage transformers are located in zone substations. Further detail of these assets is provided in the asset strategy ASD - AMS 20-63 Instrument Transformers.

OTHER - CURRENT TRANSFORMERS

Current Transformers (CTs) measure the current flowing through a high voltage electricity circuit within the distribution network and transform this current into convenient quantities for use in protection and control relays. Current transformers are located in zone substations. Further detail of these assets is provided in the asset strategy ASD - AMS 20-63 Instrument Transformers.

OTHER - CAPACITOR BANK

A capacitor bank is a grouping of several identical capacitors interconnected in parallel or in series to correct or counteract undesirable characteristics, such as power factor lag or phase shifts inherent in alternating current (AC) electrical power supplies. These are located in zone substations. This category does not include pole-top capacitors

installed on feeders. Further detail of these assets is provided in the asset strategy ASD - AMS 20-53 Zone substation Capacitor Banks.

OTHER - NEUTRAL EARTH RESISTORS

Neutral Earth Resistors (NERs) are passive devices, with no moving parts, protected from the weather within an enclosure and only operate during medium voltage network phase to earth faults. The NER limits the magnitude of the earth fault current that would flow on the occurrence of a phase to earth fault in a medium voltage circuit. This improves public safety by limiting the energy released at the fault location, reducing risk of bushfire ignition. Further detail of these assets is provided in the asset strategy ASD - AMS 20-79 Neutral Earthing Devices.

OTHER - SURGE ARRESTORS

Surge arresters (also known as surge diverters) are used to protect key items of electrical plant that are susceptible to internal failure following transient lightning overvoltages or over-voltage surges created by network switching. Surge arresters are installed between each active phase and the electrical earth grid at 66 kV line entries, on each side of power transformers, at cable ends and on 22 kV, 11 kV and 6.6 kV feeder exits from zone substations, on lines and distribution transformers. Further detail of these assets is provided in the asset strategies ASD - AMS 20-67 Line Surge Arresters and ASD - AMS 20-77 Surge Arrestors in Zone Substations.

OTHER - POLE TOP CAPACITOR

Pole-top capacitors provide reactive power at selected locations in medium voltage feeders to improve the energy transfer efficiency of the immediate and upstream network. This category does not include capacitors installed in zone substations. Further detail of these assets is provided in the asset strategy ASD - AMS 20-69 Pole Top Capacitors.

OTHER – ELECTRICAL EARTHS

Various combinations of conductors, connectors and electrodes to connect electrical equipment to the general mass of earth at over 300,000 locations. This includes electrical earths in zone substations, regulator installations, capacitor bank stations, power stations associated switchyards, distribution substations, including SWER substations, switches, cable screens, surge arresters and pole earths. Further detail of these assets is provided in the asset strategy ASD - AMS 20-59 Electrical Earths.

OTHER - LINE VOLTAGE REGULATORS

Line voltage regulators are the means by which the distribution voltage is kept at the appropriate level. Regulators are either directly mounted on a pole or on a suitable foundation in an enclosure at the base of a pole midway along a 22kV feeder. All such line voltage regulators are located in regional areas of Victoria. Both three-phase and single-phase regulators are used. Further detail of these assets is provided in the asset strategy ASD - AMS 20-68 Line Voltage Regulators.

OTHER - LOW CONDUCTOR

Portions of the medium and low voltage overhead network where conductors do not have the prescribed clearance between the ground and the conductor. The units are the number of individual sites where capital expenditure is required to ensure conductors have the prescribed clearance. Activities include installing taller poles, replacing conductors and rerouting lines.

	OTHER – REFCL
	Rapid Earth Fault Current Limiters (REFCL) is electrical protection technology designed to minimise the fault current (energy) dissipated from phase to earth (wire to ground) faults on the 22kV network in order to reduce the risk of fire ignition associated with network incidents.
	Expenditure reported is aligned with the replacement expenditure incorporated in the AER's Decision Installation of Rapid Earth Fault Current Limiters (REFCLs) – tranche three. Volumes reported are the number of REFCL installations.
	OTHER – TOP DOWN ADJUSTMENT
	To account for potential overlaps / boundary issues between categories, a top down adjustment has been included in the CAPEX forecast. This category covers the REPEX component of this adjustment. Further details on this calculation can be found in the document Top Down Adjustment.
	OTHER – SUPPORT
	This category covers costs incurred for work performed on AusNet Services' network by other parties. [C. I. C
].
5.1(a)(i)(B)	Boundary issues and any overlap are accounted for in the top-down adjustment. Refer to sections 9.6 and 9.8 of our EDPR proposal.
5.1(a)(i)(C)	The majority of assets in template 2.2 are forecast for replacement due to the condition of the assets or obsolescence; factors which are generally associated with asset aging. The assets in template 2.2 which are primarily driven by factors other than asset aging are:
	Overhead conductors – Other
	Costs and volumes in this category relate to a proactive program of SWER line replacement in Codified Areas. This program will replace existing SWER lines which are nearing, but have not reached, end-of-life with underground or insulated conductor. The costs associated with this replacement are materially different to like-for-like replacement. Further information on this program is included in chapter 9 and the Codified Areas Strategy document.
	Switchgear – Other
	Contains fuse replacement volumes from the EDO fuse replacement program as well as a risk-based asset replacement program. Further information is included in ASD - AMS 20-61 MV Fuse Switch Disconnectors.
	Other – Low Conductor Costs and volumes in this category are driven by regulatory compliance.
	Other – REFCL Volumes in this category are the number of REFCLs installed in tranche 3. Costs relate to the portion of the project where existing assets are replaced. Generally, the need to replace these assets is related to the ability of the assets to withstand the increased voltages associated with REFCL operation; not the condition or age of the asset.

5.1(a)(i)(D)	With the exception of pole staking and rebutting, the unit rates supplied in the Unit Rates document (see Appendix 3.2) provide for the complete replacement of the assets. Pole staking and rebutting are capitalised as they extend the useful life of an asset.						
5.1(a)(ii)		2016	2017	2018	2019	2020	
	Condition & obsolescence	78%	78%	77%	77%	76%	
	Augmentation	< 1%	< 1%	< 1%	< 1%	< 1%	
	Safety	22%	21%	22%	23%	24%	
	Security	< 1%	< 1%	< 1%	< 1%	< 1%	
	Environmental	1%	1%	1%	1%	1%	
	Description: Condition & obsolescence can no longer be maintaine based on the age of the ass Augmentation – Existing as the network. Safety – Assets that are p Capital Expenditure chapte Security – Assets replaced Environmental – Assets rep	ed. Note set. ssets re orimarily r of the to main	e that A eplaced y replac submis itain or	AusNet during ced to sion for improve	Service project improve further the ph	es does s that i e netwo detail. ysical s	not replace any assets ncrease the capacity of ork safety. Refer to the ecurity of the network.

affected asset categorie	Asset categories	Impact
Network safety obligations (Rules, codes, license conditions, statutory requirements)	Lines assets including cross-arms, conductors, EDO fuses. Secondary equipment	In some cases, assets are replaced before the end of their effective life in order to reduce the risk of bushfire ignition. In some cases, assets are replaced with newer models / technology to meet regulatory obligations. Refer to Codified Areas Strategy for more details.
Development of asset management system and& techniques (Internal planning and asset management approaches.)	Most asset categories	Risk based analysis leads to life extension of lower risk assets; particularly in stations. Improved condition monitoring techniques should lead to more targeted replacement of assets resulting in life-extension of some assets and less failures in other asset classes. Improved condition assessment and data leads to more accurate forecasts of replacement needs. Refer to plant asset strategies for more details.
Asset factors – asset age profile and risk profile	Poles, cross-arms, conductor, power transformers, circuit breakers	The quantity of assets reaching the end of effective life drives the need for asset replacements. If changes in failure rates are noticed, this may lead to a re- evaluation of asset risk profiles, driving a change in replacement rates. Refer to ASD - AMS 20-52 Conductor, ASD - AMS

		20-57 Crossarms and ASD - AMS 20-70 Poles for more details.
External factors - Security requirements	Zone substations	The threat of terrorist related activity and increasing incidents of theft leads to increasing measures to mitigate the risk. These measures lead to changing standards and higher replacement costs. For example, a deteriorated zone substation fence will be replaced with a more expensive fence. Refer to ASD - AMS 20-14 Infrastructure Security for more details.
Technology solutions	Zone substations, Voltage Regulators, Conductors	As customers increase their use of DER, an increase in voltage stability issues is forecasted across our network. Some equipment must be upgraded and replaced to mitigate the effects of increased DER. Refer to ASD - AMS 20-50 Steady State Voltage Compliance for more details.

7.3 (a)	There have been no new non-network alternatives that AusNet Services has commenced during the current regulatory period. The Networks Renewed Trial was not an alternative to augmentation but was to demonstrate how reactive power support could manage supply voltages and maintain them within the Distribution Code limits.					
7.3 (b)	forthcoming generation/st	Non-network alternatives selected to commence during, or will continue into, the forthcoming regulatory control period include the third party-owned generation/storage/demand response solution to alleviate emerging constraints on feeders supplied by Warragul zone substation.				
7.4						.C] per annum ecifically feeder
7.5	Actual and forecast payments to embedded generators to avoid network augmentation are shown below. Embedded Generator Actual					
		2016	2017	2018	2019 (F'cast)	2020 (F'cast)
	Bairnsdale			[C.I.C]		
	Traralgon	[U.I.U]				
	Forecast	0004	0000	0000	2024	2005
	Bairnsdale	2021	2022	2023	2024	2025
	Traralgon			[C.I.C]		

10.3	AusNet Services has interpreted step changes as Safety programs with a compliance driver in the forecast period. Forecast costs for these programs are generally due to an "externally imposed change in the scope or scale of required capex".					
	 Programs that satisfy the definition of forecast step changes include: replacement of bare SWER conductor in Codified Areas with HV ABC Tranche 3 REFCL Construction, Testing and Commissioning Augmentation to address the capacitive current seen by REFCL's 					
10.7 (a) and	See attached REFCL compliance letter and 2019 Compliance Report Legislated					
(b)		tigation Prog				
10.8 (a)		step change nstrument(s)		esponse to paragraph 10.7, the relevant		
	req	uire all new a	and replacer	fire Mitigation) Regulations 2013 which nent (≥4 consecutive spans) powerlines d or covered wire.		
	201		Bushfire Mi	fire Mitigation) Amendment Regulations tigation Regulations) which require		
10.8 (b)	The step ch	nanges are be	eing driven by	y ongoing compliance obligations		
16.3 (r)(i)(A)						
	Project	Feeders	Future Load Transfers	Comments		
	New CRE24	CRE31	0	CRE31 is situated in the South Eastern growth corridor. Project timing is selected after CRE31 has reached its rating and thus no load transfer capability.		
	New DRN24	DRN11, DRN12, DRN21	0	DRN12 is situated in the Northern growth corridor. Project timing is selected after all neighbouring feeders have reached their ratings and thus no load transfer capability.		
	New OFR11	OFR22, OFR23E, OFR24, PHM32	0	OFR 22,23E and 24 are situated in the South Eastern growth corridor. Project timing is selected after all neighbouring feeders have reached their ratings and thus no load transfer capability.		
	New PHM23S	PHM33N	0	PHM33 is situated in the South Eastern growth corridor. Project timing is selected after all neighbouring feeders have reached their ratings and thus no load transfer capability.		
	Upgrade MOE13	MOE13	0	MOE13 supplies the township of MOE and is expected to exceed its thermal rating by 2022. Neighbouring feeders are also heavily loaded and thus no load transfer capability.		
	Upgrade	KLO14	0	KLO14 is situated in the Northern		

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	KLO14		growth corridor. Load transfer not		
			possible and upgrade is the most		
			economical solution.		
16.3 (r)(i)(B)	-	1			
	Project	Load	Comments		
		Growth			
		Rate			
	New CRE24	5% p.a.	Growth rate 2019-2028 for CRE31		
	New DRN24	4-5% p.a.	Growth rate 2019-2028 for DRN12		
	New OFR11	3-4% p.a.	Growth rate 2019-2028 for OFR22, 23 and 24		
	New PHM23S	3-4% p.a.	Growth rate 2019-2028 for PHM33		
	Upgrade MOE13	2% p.a.	Growth rate 2019-2028 for MOE13		
	Upgrade KLO14	2% p.a.	Growth rate 2019-2028 for KLO14		
16.3 (r)(i)(C)	There are no assu	med block loa	ads and associated demand assumptions for any		
	of the projects.				
16.3 (r)(ii)	There is no existing large scale embedded generation capacity connected to the				
			embedded generalion eaplaidy connected to the		
	feeders to be augmented.				
16.3 (r)(iii)	There is no future embedded generation capacity forecast on the feeders to be				
10.0 (1)(11)	augmented.	ciniscudeu g	cheration capacity forceast on the recuers to be		
	augmenteu.				
16.3 (r)(iv)	There are no non-r	otwork soluti	ons on the feeders to be augmented.		
			ons on the requers to be augmented.		
16.3 (r)(v)	No future non-ne	work solutio	ns are assumed for the feeder augmentation		
10.5 (1)(1)	No future non-network solutions are assumed for the feeder augmentation				
	projects.				
16.3 (r)(vi)	There is no divorsi	ty botwoon f	adars. All feeders subject to augmentation and		
10.3 (1)(1)	There is no diversity between feeders. All feeders subject to augmentation and adjacent feeders that could provide load transfer experience an evening peak.				
		at could prov	nue loau transfer experience an evening peak.		

3 Appendices

3.1 Vegetation Management Audits

Please refer supporting documents :

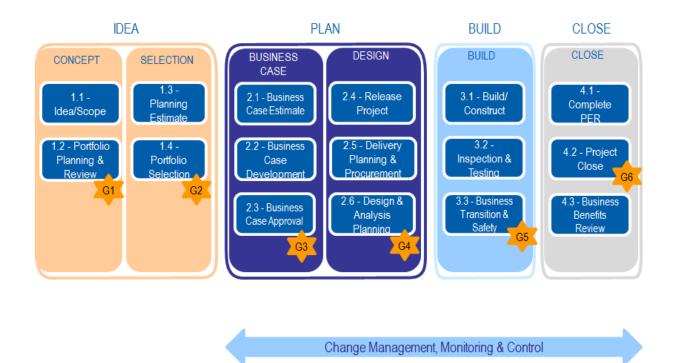
ASD - ESV - 2017 Major Electricity company BFM and ELC Audit - August 2017 – PUBLIC ASD - ESV - 2016 Bushfire Mitigation and Electric Line clearance Audit - October 2016 - PUBLIC ASD - ESV - 2018 Bushfire Mitigation and Electric Line Clearance Audit Report - 271118 - PUBLIC

3.2 Unit Rates

Please refer file ASD - Appendix 9B Unit Rates - 041019 - PUBLIC

3.3 Project deliverability

Projects are delivered through a Stage Gate process as shown below:



The purpose of stage gates on a project or program is to provide management the opportunity to:

Health and Safety

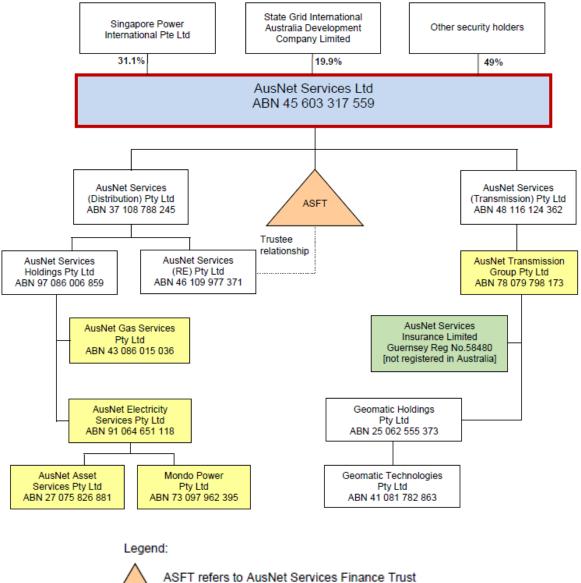
- Review quality and progress
- Track funding/resources
- Attain confidence that the project is being delivered as planned

- Confirm the project remains in line with business strategies and will achieve the benefits expected
- Determine whether to continue, slowdown or stop the project

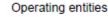
Gate	High-Level Description
Gate 1 (G1)	Stage Gate 1 is a business owned gate when a project has a higher degree of certainty in regard to scope, timing and cost.
Gate 2 (G2)	By applying for Stage Gate 2 approval, it is expected that the project has been created in SAP and the Idea Phase is complete. Gate 2 is used to validate that SAP has been setup correctly, the project is aligned with business expectations and it is suitable for selection into a portfolio for development of a Business Case. Following Gate 2 approval, Initiators will hand over projects to the allocated Project Manager. The PM will take the project through development for Business Case scoping and estimating.
Gate 3 (G3)	By applying for Stage Gate 3 approval, it is expected that the Business Case has been approved and the Business Case Stage under the Project Lifecycle has been completed. Gate 3 is used to validate that the Business Case is approved in accordance with delegations and key information in SAP is identical to the approved Business Case.
Gate 4 (G4)	By applying for Stage Gate 4 approval, it is expected that the Design Stage under the Project Lifecycle has been completed to the extent that site construction can commence. In submitting Gate 4, the following requirements must be met: - Project design must be complete to a point that allows site construction to commence - A Project Management Plan must be active and endorsed by stake-holders - Equipment records must be established in SAP for all new equipment These activities and deliverables must be completed prior to transition into the Build phase. Where applicable, a P90 Control cost estimate should be completed and loaded in SAP, or a date for completion nominated by the Project Manager.
Gate 5 (G5)	Gate 5 is used to inform stakeholders that the project has achieved practical completion, and that only close activities remain. By proceeding to Stage Gate 5, it is expected that the Build Phase under the project lifecycle has been completed. All the assets in the scope of works are in service and have been handed over to operations, and equipment records have been updated in SAP. Upon approval of Stage Gate 5 the project will progress to the Close phase and only minor works and administrative actions remain.
Gate 6 (G6)	By proceeding to Stage Gate 6, it is expected that the Close Phase under the project lifecycle and all activities associated with the project have been completed. Gate 6 is used to validate that the project is ready for formal closure. Upon approval of Stage Gate 6 the project will be officially closed in SAP-PPM and PS.

3.4 AusNet Services Corporate Structure

AusNet Services Corporate Structure (as at 5 November 2019)

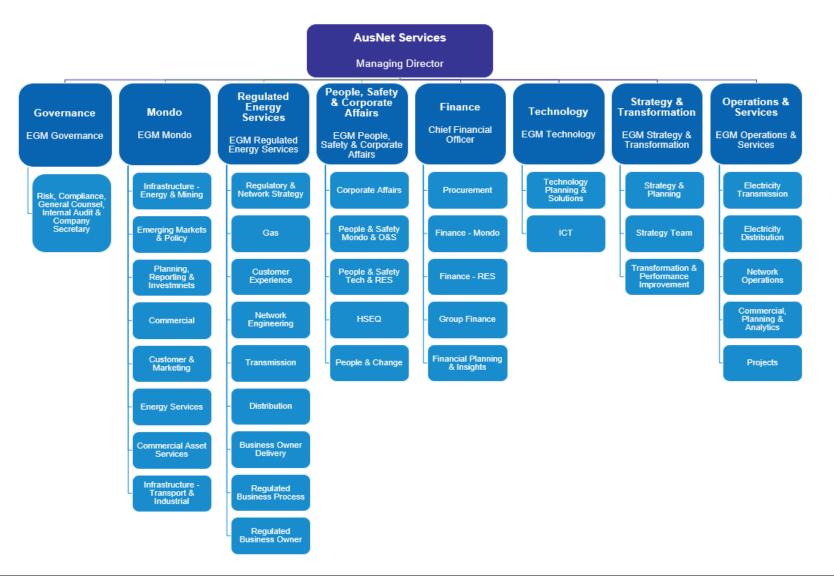






International entity

3.5 AusNet Services Organisational Structure



3.6 Forecast Distribution System Maps

