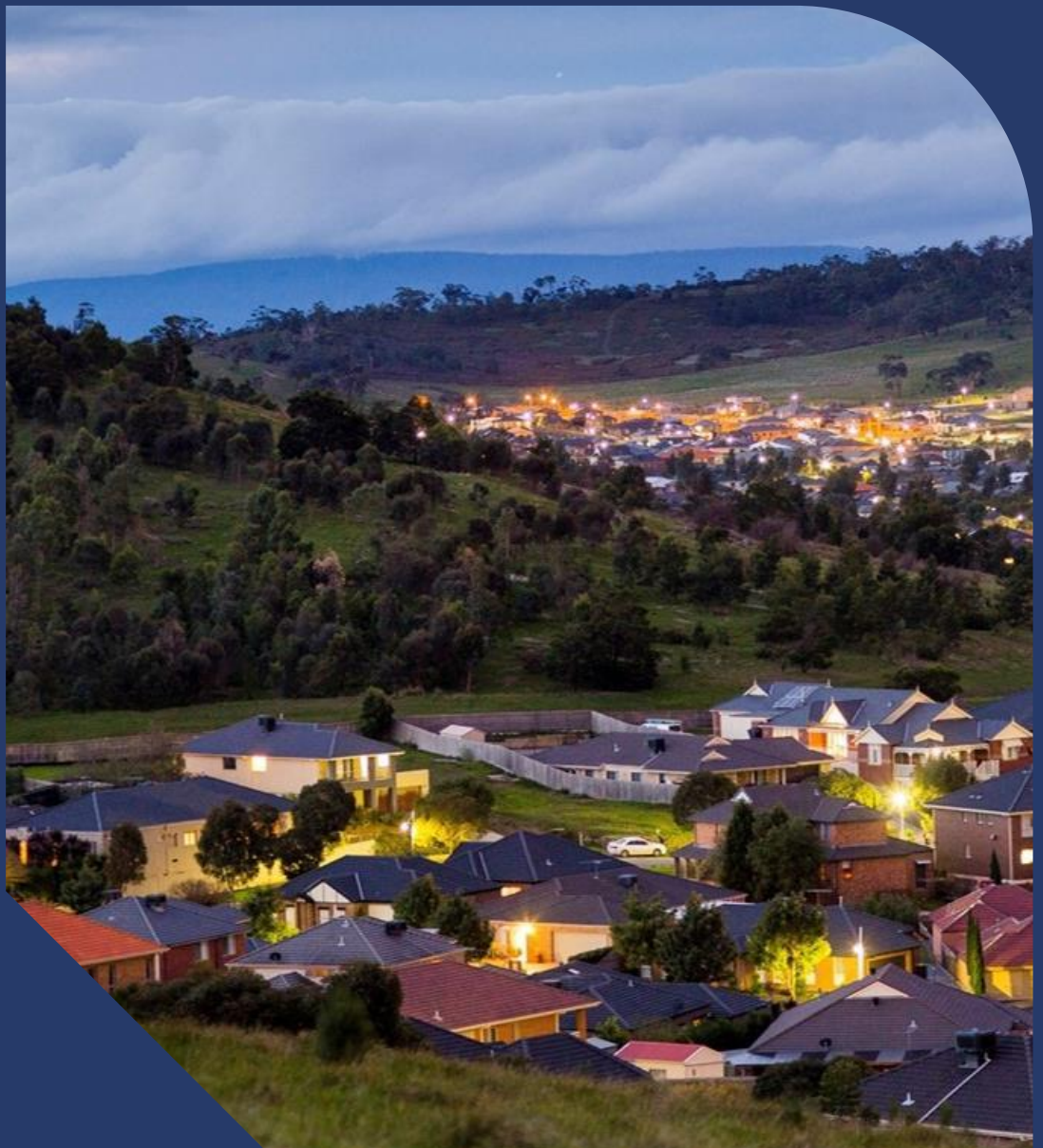


AusNet

Technical Document: Top-Down Review

2027-2032 Transmission Revenue Reset



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Abbreviations and Definitions

TERM	DEFINITION
CB	Circuit Breaker
CT	Current Transformer
CVT	Capacitive Voltage Transformer
EDPR	Electricity Distribution Price Review
ES	Earth Switch
HV	High Voltage
IT	Instrument Transformer
LV	Low Voltage
PEX	Capital Expenditure
PT	Power Transformer
VT	Voltage Transformer
REPEX	Replacement Expenditure
CAPEX	Capital Expenditure

1. Executive Summary

As part of AusNet's assurance process, we have reviewed the Major Station programs in relation to projects across each asset class within the transmission replacement portfolio. Periodic audits are conducted during the feasibility and viability study phases of the Transmission Revenue Reset (TRR) proposal. These audits involve comparing Major Station program documentation with the transmission asset replacement programs.

Through these reviews, a small number of overlaps were identified. Each instance was assessed and addressed through prompt deconfliction and coordination activities. These actions prevent any duplication of capital expenditure within the TRR proposal.

2. Introduction

2.1. Purpose

This document describes the top-down review that AusNet has applied to the forecast Capital Expenditure for the regulatory period 2027-32. It investigates areas of potential overlap between various line items of the capital forecast to establish if expenditure has been double counted and confirm that overlaps have been removed.

2.2. Scope

The scope of this document is the CAPEX forecast for the TRR regulatory period 2027-32. It includes network and non-network components across projects and programs.

This document excludes:

- Justification of proposed expenditure.
- Augmentation projects
- VTP projects (refer to Technical Document Victorian Transmission Plan Interactions)

2.3. Background

AusNet has built up its CAPEX forecast using a bottom-up approach. A series of projects and programs are proposed to address various drivers. (Major) Projects address issues at specific geographical locations and may require work on a range of different asset classes. Meanwhile, asset replacement programs typically address one specific asset class where the individual assets are located across multiple locations.

Each program or project identifies a driver for expenditure and estimates the volume and cost of assets required. The identification of assets for some programs is based on asset or fleet specific information and may not take into account interrelationships with other works being proposed or conducted. There is therefore the potential for overlap and synergies between programs and projects where two or more bodies of work are undertaken at the same location or propose to replace the same asset. In some cases, the replacement of one asset class may require the replacement of other physically or electrically connected assets. In other cases, it is economically efficient to bring forward non-essential replacements to coincide with required work.

AusNet Services has therefore conducted a top-down adjustment to its programs and projects to account for any overlap between components of the program are accounted for in the CAPEX forecast. The interrelationship between components of the program have been accounted for in two ways; by adjusting the forecast during the bottom-up build and if necessary, by application of a top-down adjustment following this review. As the majority of major projects are initiated as a result of multiple closely identified replacements, much of the overlap has already been removed during the bottom up build. This document systematically reviews the various line items of the CAPEX forecast to identify any residual overlaps.

3. Asset Locations

AusNet's Transmission Network assets can generally be classified as either "Stations", "Lines", "Protection", or "Communications". These categories are mutually exclusive and in terms of the replacement programs listed in the CAPEX forecast, are also collectively exhaustive. As each replacement program targets specific asset classes, they are within themselves mutually exclusive. It is uncommon that replacement of an asset in one category relies upon or necessitates the replacement of an asset in another.

When large amounts of deteriorated assets are identified in close proximity to each other, a Major Project is initiated to replace multiple assets or asset classes at once. This achieves delivery efficiencies as resources can be engaged to replace multiple assets without needing to remobilise. This approach also improves customer outcomes as the availability of terminal stations is increased when multiple assets are replaced during the same outage. This leads to an improvement in reliability and system security. There are 13 Major Projects included in the CAPEX forecast.

Other types of projects which might require multiple asset classes to be replaced simultaneously include augmentation. However, these are not relevant to the TRR and are thus out of scope for this review.

4. Major Station Projects

Table 1 identifies the major projects that will form part of the regulatory reset of 2027-32. These projects will have their scope reviewed against transmission asset replacement programs.

(Major) PROJECT ID	STATION	PROJECT DESCRIPTION	OVERLAP IDENTIFIED AND RECTIFIED
TD-8025	SMTS	500kV GIS and F2 Transformer Replacement	
TD-14633	SMTS	330/220kV Transformer Replacement	
TD-3454	KTS	KTS 500/220kV Transformer Replacement	Yes
TD-13613	NPSD	220kV GIS	
TD-16808	WOTS	Spare 330/66/22kV Transformer Procurement	
TD-8026	DDTS	H3 330/220kV Transformer and Circuit Breaker Replacement	
TD-0013738	ROTS	500 kV GIL Replacement	
TD-003597	TTS	66kV Circuit Breaker Replacement	Yes
TD-16676	TTS	B4 Transformer Replacement	
TD-8023	LYPS & HWTS	500kV Circuit Breaker Replacement Stage 2	Yes
TD-15756	BATS	B2 Transformer Replacement	Yes
TD-8003	MWTS	66kV Circuit Breaker Replacement	Yes
TD15756	MLTS	220kV Shunt Reactor Replacement	

5. Station Analysis

This section presents the results of a comparative analysis of the asset replacement program scope against the scope of major station programs, evaluated on a station-by-station basis where major station works are scheduled to occur.

5.1. SMTS

Major Station Projects

- TD – 008025: 500kV GIS and F2 Transformer Replacement
- TD – 14633: 330/220kV Transformer Replacement

Potential Overlap

Transmission Infrastructure Replacement/Rectification Program

The transmission Infrastructure program is scoped to restore condition of road assets at the SMTS site. Both major stations programs do not include scope for this civil work. Ausnet can confirm there is no overlap in proposal for these programs.

Power Transformer Replacement Program

Transmission asset replacement program includes the replacement of power transformer components. This includes Transformer Management Systems for B1 and B3 power transformers only. While the major station projects intend to replace various assets at SMTS, AusNet can confirm there is no overlap in scope with asset replacement programs.

5.2. KTS

Major Station Projects

TD-3454: KTS 500/220kV Transformer Replacement

Potential Overlap

Circuit breaker Replacement Program

One circuit breaker was identified as an overlap with the KTS major stations project. Descoping has occurred and the CB is removed from the transmission asset replacement program while the major stations project will retain this equipment. AusNet can confirm there is now no overlap on TRR proposal for projects at KTS.

Secondary System Replacement Program

Identified overlap in scope of Remote Terminal Units. AusNet has descoped the transmission asset replacement program while the major stations program will retain the scope of RTU replacements. AusNet can confirm there is no longer an overlap in the TRR proposal.

DC System Replacement Program

Asset Replacement program includes DC system replacement at KTS however, there is no scope for DC systems replacement within major station projects. AusNet can confirm there is no overlap on between these programs.

5.3. NPSD

Major Station Projects

TD-13613: NSPD 220kV GIS

Potential Overlap

The asset replacement program includes communication system replacements at NPSD. There is no scope for this in the Major Project and consequently AusNet can confirm there is no overlap in the TRR proposal.

5.4. WOTS

Major Station Projects

TD-16808: Spare 330/66/22kV Transformer Procurement

Potential Overlap

Power Transformer Replacement Program

The asset replacement program include replacement of power transformers X1 and X2 66kV Bushings and winding temperature indicators. The major stations project scope is to procure and store a spare transformer. AusNet can confirm there is no overlap in the TRR proposal.

Secondary Systems Replacement program

Secondary asset replacement program is scoped to replace the station remote control unit (RTU) and weather station. AusNet can confirm there is no overlap in the TRR proposal.

5.5. DDTs

Major Station Projects

TD-8026 – H3 330/220kV Transformer and Circuit Breaker Replacement

Potential Overlap

Secondary System Replacement Program

The asset replacement program for secondary systems includes the installation of a weather station and 220kV Line protection replacements. The Major Station includes secondary components related to

Transformer protection and voltage regulation. AusNet can confirm there is no overlap between the asset replacement and major station programs.

Power transformer replacement program

The asset replacement scope for the power transformer component include winding temperature indicator replacements for H1 and H2 power transformers, The asset replacement program includes the early period replacement of the H3 330kV Bushing due to the risks of bushing failure. The major station project is a contingent project, and includes replacing the whole H3 transformer. Being a contingent project its execution depends on certain conditions being met, as a result, delays in replacement are possible, whereas bushing replacement should not be delayed. AusNet can confirm there is no overlap in the proposal.

5.6. ROTS

Major Station Projects

TD-0013738 - 500 kV GIL Replacement

Potential Overlap

Circuit breaker Replacement Program

Four 220kV minimum oil circuit breakers and one 220kV SF6 live tank type are included in the asset replacement program, while the major station project is scoped for the replacement/installation of GIL and associated surge arrestors. There is no overlap in in scope between the two programs.

5.7. TTS

Major Station Projects

- TD-003597 – 66kV Circuit Breaker Replacement
- TD-16676 – B4 Transformer Replacement

Potential Overlap

Power Transformer Replacement Program

Asset replacement program includes the replacement of Transformer Management Systems components for B2 and B3 transformers. While the major project intends to replace F2 transformer and switch gear, there is no overlap in scope with asset replacement programs.

Auxiliary Supply systems replacement Program

An overlap in scope to replace battery systems was identified. Deconfliction has occurred. The scope will remain in Major station projects. The scope has been removed from the asset replacement programs. Ausnet can confirm there is now no overlap in the TRR submission.

5.8. LYPS & HWTS

Major Station Projects

TD-8023 – 500kV Circuit Breaker Replacement Stage 2

Potential Overlap

Transmission Infrastructure Program

The asset replacement program includes scope to replace the fire hydrant system. The Major Station program does not have any planned civil works at this location, and therefore no overlap exists.

Power Transformer Replacement Program

The asset replacement program includes replacing the power transformer winding temperature indicator components for A1, A2, A3, A4 and the spare transformer. The asset replacement program includes the A1 transformer 500kV and 220kV bushings replacements and was found to overlap with the Major Station scope. As such the bushing scope has been removed from the major station project and retained in the asset replacement program. As a result, Ausnet can confirm there is now no overlap in the TRR submission.

5.9. BATS

Major Station Projects

TD-15756 – B2 Transformer Replacement

Potential Overlap

Secondary System Replacement Program

An overlap was identified between the asset replacement and the major station program for protect and control device replacements. These devices have been descoped from the asset replacement program and retained in the major station program. AusNet can confirm there is no overlap in the TRR proposal.

Power Transformer Replacement Program

The asset replacement program includes power transformer component Transformer Management Systems replacement on the B1. The major projects have scope for the replacement of B2 transformer only, and there is no overlap in scope.

Surge Arrester Replacement Program

The asset replacement program intends to replace three station service transformer surge arrestors at BATS. The major station project is scoped only for B2 power transformer, civil work and protect and control equipment. Ausnet can confirm there is no overlap in the TRR proposal.

5.10. MWTS

Major Station Projects

TD-8003 – 66kV Circuit Breaker Replacement

Potential Overlap

Power Transformer Replacement Program

The asset replacement program is scoped for the replacement for winding temperature indicator component on the B1 and B3 transformer. AusNet can confirm there is no overlap in proposal for the replacements listed above.

The MWTS B3 220kV & 66kV bushings replacements scope within major projects was found to overlap with the asset replacement programs. The bushings were descope from Major projects and retained in the asset replacement program. As a result, there is no overlap as part TRR proposal.

5.11. MLTS

Major Station Projects

TD-15756 Project – MLTS 220kV Reactor Replacement

Potential Overlap

Power Transformer Replacement Program

The asset replacement program proposes to replace the 500kV Shunt Reactors, three power transformer bushings and one winding temperature indicator component. The Major station project is scoped only for the 220kV Shunt Reactor work. Ausnet can confirm there is no overlap in the TRR proposal.

6. Schedule of Revisions

ISSUE NUMBER	DATE	DESCRIPTION	AUTHOR
0.1	31/08/2020	Initial Document	Jensen Lai
1	07/10/2020	V1 reviewed after finalisation of CAPEX for cast	Jensen Lai
2	30/09/2025	Review and update prior to 27-32 TRR Submission	Mark Allen

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