united energy

ASSET CLASS OVERVIEW

UNDERGROUND CABLES

UE BUS 4.04 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Overview

Our underground cable system is critical to our ability to maintain network reliability and minimise safety risk as far as practicable.

For the 2026–31 regulatory proposal, our expenditure forecast only includes fault and corrective replacements. Given the random nature of underground cable failures, including the variable length of any corresponding cable replacements, our fault and corrective forecasts for underground cable systems are based on a simple average over the previous five-year period.

A summary of our forecast expenditure for underground cable systems for the 2026–31 regulatory period is set out in table 1.

TABLE 1 UNDERGROUND CABLE SYSTEMS: EXPENDITURE ($M, 2026)

EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
Corrective cable: LV	1.6	1.7	1.8	1.9	2.0	9.0
Corrective cable: HV	4.7	4.9	5.1	5.3	5.5	25.4
Underground pits and pillars	1.9	1.9	2.0	2.0	2.1	9.8
Ampact connectors	0.2	0.2	0.2	0.2	0.2	1.0
Total	**8.4**	**8.7**	**9.1**	**9.4**	**9.6**	**45.3**

2. Background

Underground cable systems provide the electrical conducting medium to connect low voltage (LV), high voltage (HV) and sub-transmission distribution networks.

The cables themselves are constructed with the conducting medium (i.e. conductor) in the centre of the insulated core and additional layers that provide earthing and mechanical protection. The insulation is a non-conducting material that provides an electrical and physical barrier between the energised conductors in the cable and earth.

This section provides an overview of our underground cable asset class, including a high-level summary of our compliance obligations, asset population and age profile.

2.1 Compliance obligations

We operate under a combination of national and state legislation which establish our obligations and the regulatory framework under which we operate.

The National Electricity Rules sets out reliability and safety obligations and the Electricity Distribution Code of Practice include performance requirements. We must also manage our network assets in accordance with the Electricity Safety Act 1998, the Electricity Safety (Management) Regulations 2019, the Electricity Safety (Bushfire Mitigation) Regulations 2023 and the Victorian Environment Protection Act 2017.

These obligations can be summarised as follows:

- Electricity Safety Act 1998 – requires us to minimise safety risk 'as far as practicable' including bushfire danger
- Electricity Distribution Code of Practice – requires us to manage our assets in accordance with principles of good asset management and to minimise the risks associated with the failure or reduced performance of assets
- National Electricity Rules – requires us to forecast expenditure to maintain the quality, reliability and security of supply of our networks and maintain the safety of the distribution system
- Victorian Environment Protection Act (2017) – requires us to reduce the risk of harm from our activities to human health and the environment and from pollution or waste.

In short, we must maintain reliability, minimise safety risk 'as far as practicable' including bushfire danger arising from our network, and reduce the risk of harm to the environment.

2.2 Asset population

Our underground cable systems comprise of our underground cables, joint and terminations, cable pits and pillars to provide access points, and the electrolysis cable system (which includes cables and drain boxes).

The volumes associated with each of these assets are set out in table 2 and table 3.

TABLE 2 UNDERGROUND CABLE: POPULATION BY VOLTAGE (KM)

CABLE VOLTAGE	LENGTH
≤ 1kV	2,278
> 1kV and ≤ 11 kV	244
> 11kV and ≤ 22kV	959
> 33kV and ≤ 66kV	3
Total	**3,484**

TABLE 3 CABLE PIT, PILLAR AND DISTRIBUTION CABINET: POPULATION

ASSET TYPE	VOLUME
Distribution cabinet	734
LV pillar	10,124
LV pit	137,179
Total	**148,037**

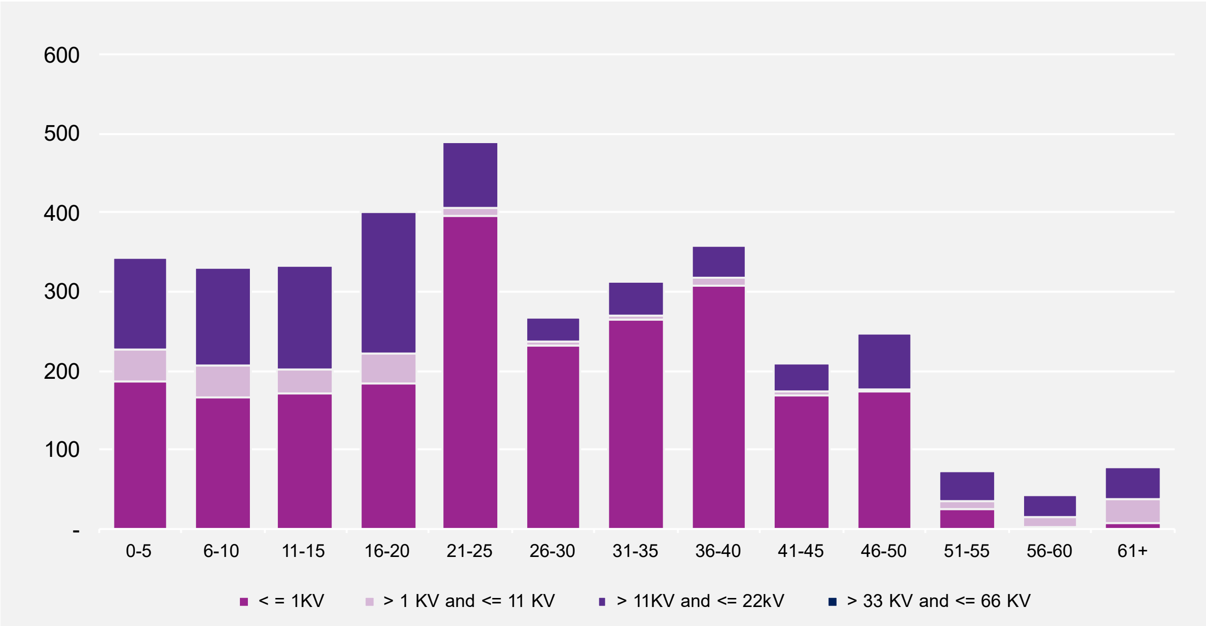
2.3 Asset age profile

The age profile of our underground cable population is shown in figure 1.

The expected service life for these cables is around 50-years, noting that while we do not replace underground cable based on age, the service life is the expected period of time after which the asset is unlikely to be fit for purpose (typically determined by safety, technology obsolescence and the least cost/most economic time to replace the asset).

We do not have age records for our pits, pillars and electrolysis cable systems.

FIGURE 1 UNDERGROUND CABLE: AGE PROFILE BY MATERIAL TYPE (KM)



3. Identified need

The performance of our cable systems may impact our network service level as failures may lead to a loss of supply for customers, pose safety risks to our personnel and the public, start fires (for above ground terminated cables), and/or pollute the environment with an oil leak from oil insulated cable.

The identified need, therefore, is to manage our cable asset class to maintain reliability and minimise safety risks as far as practicable, consistent with our regulatory and legislative obligations.

The large volume of our cable systems population, and its underlying condition and age profile, is also driving the need to consider whether current intervention volumes will allow us to continue to prudently manage deliverability and safety factors over time.

This section outlines the historical performance and condition of our underground cable systems, which has informed how we assess (and respond, as required to) this identified need.

3.1 Historical asset performance

In assessing the need to intervene on our underground cable assets, we monitor several performance indicators. These include:

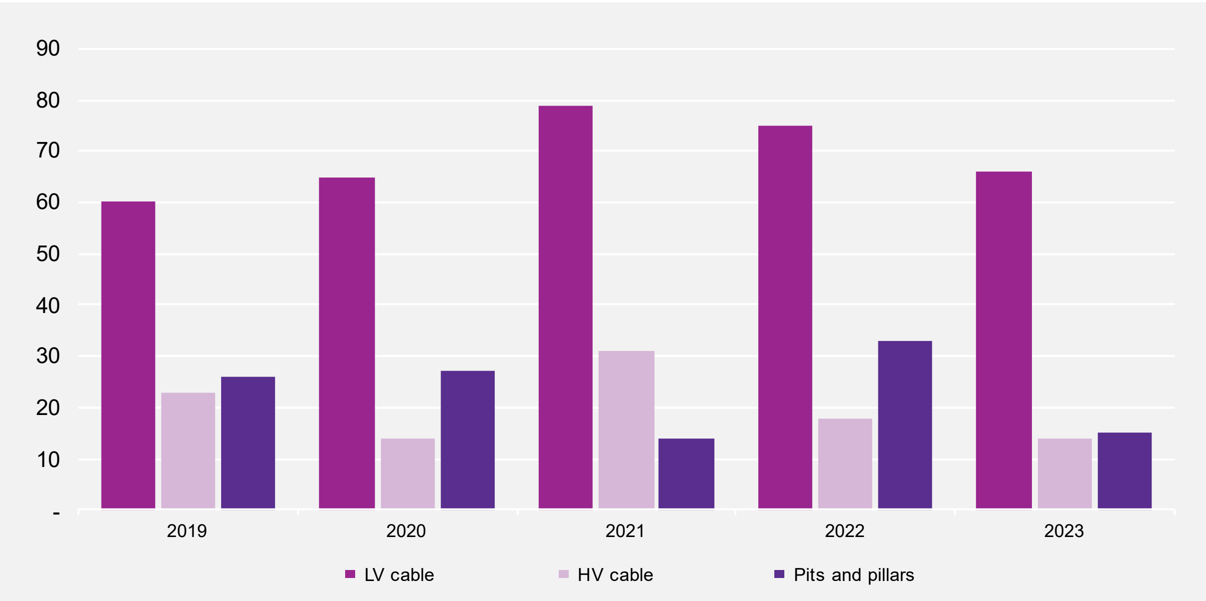
- failures, which are functional failures that occur while the asset is in service
- high priority defects, which can indicate deteriorating asset condition and are leading indicators of future asset failures.

We capture historical asset failures and defects for our LV and HV cables, and pits and pillars.

3.1.1 Historical asset failures

As shown in figure 2, cable failures have fluctuated year-on-year, with a trend in LV cable failures that remains elevated

FIGURE 2 CABLE SYSTEMS: FAILURES BY TYPE



3.1.2 Historical asset defects

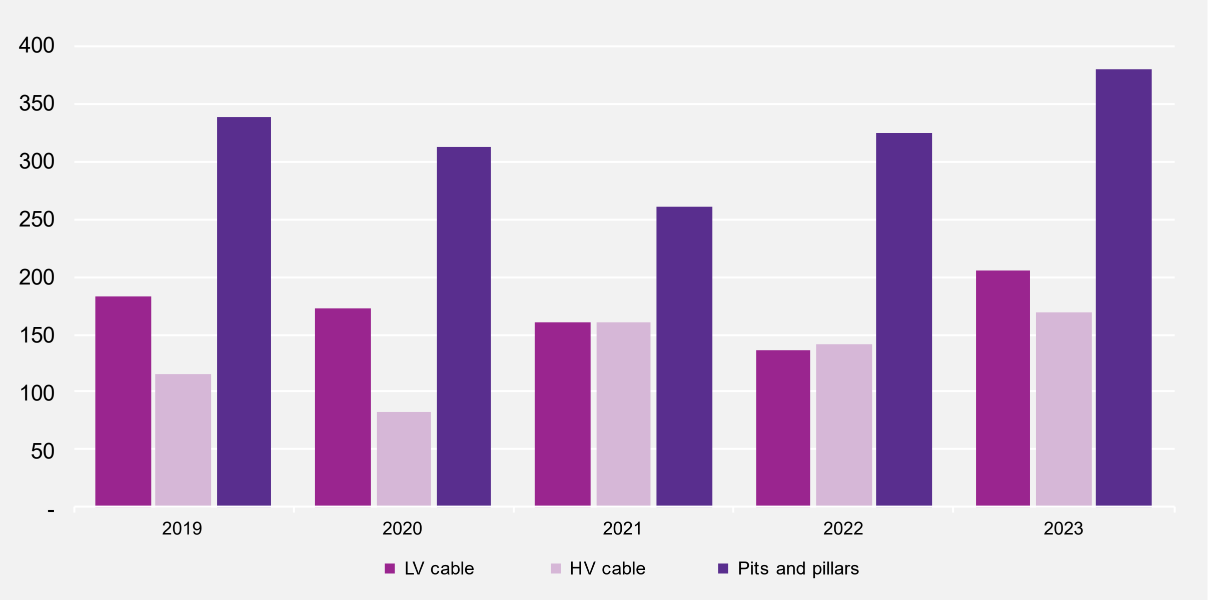
Our response to identified defects depends on the nature and severity of the defect. High priority defects that result in intervention are shown in table 4.

TABLE 4 RESPONSE TIMEFRAMES FOR HIGH PRIORITY DEFECTS

PRIORITY	TIMEFRAME FOR INTERVENTION
P1	Make safe within 24 hours of identification (replacements or repairs can occur beyond the initial 24 hours)
P42	Addressed within 42 days of identification
P2	Addressed within 32 weeks of identification

As shown in figure 3, the number of high priority HV cable defects has been increasing from 2020. The number of high priority LV cable and pits and pillars defects have been relatively stable, except for an increase in 2022.

FIGURE 3 CABLE SYSTEMS: HIGH PRIORITY DEFECTS



3.2 Demand growth

The electrification of everything from homes to transport, along with ongoing population growth, will require our energy system to evolve. By 2031, for example, we are forecasting a 25 per cent increase in annual consumption and 5 per cent growth in peak demand.

Growth in demand increases the energy that would not be supplied to customers if our distribution switchgear failed.

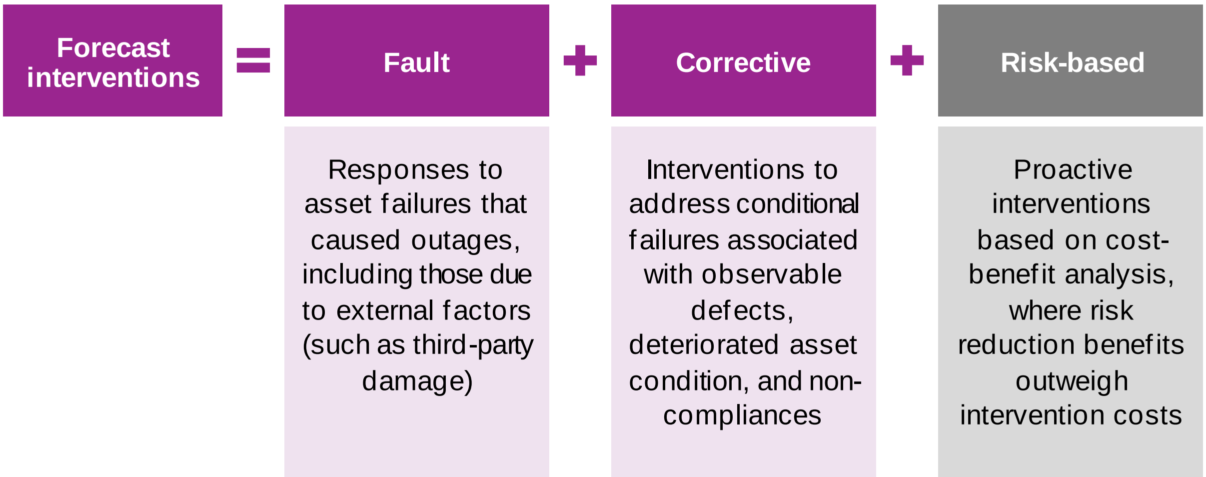
We forecast demand at an asset level. Our risk modelling uses these asset level demand forecasts to accurately evaluate the energy at risk of not being supplied to customers downstream of specific assets.

4. Forecast interventions

Our current asset management approach for underground cable systems includes a balance of condition monitoring (such as online partial discharge monitoring), reactive repairs or replacements, and targeted risk-based replacement programs. For repairs, this typically entails cutting and replacing part of the cable with cable joints. Complete cable replacement, however, will eventually be required due to economic or technical drivers (e.g. where multiple cable sections are deteriorated, it may be prudent and efficient to replace the entire length).

The derivation of forecast interventions for the 2026–31 regulatory period for our underground cable systems is based on two broad categories—faults and corrective. Our forecast does not include any risk-based investments. This approach is summarised in figure 4.

FIGURE 4 FORECAST CATEGORIES



4.1 Forecast volumes

For the 2026–31 regulatory period, a summary of forecast volumes for our underground cable systems is shown below. As this asset class comprises a mix of lengths and units, these are shown separately in table 5 and table 6 respectively.

TABLE 5 UNDERGROUND CABLE SYSTEMS: VOLUMES (KM)

VOLUMES	FY27	FY28	FY29	FY30	FY31	TOTAL
Corrective cable: LV	5.2	5.7	6.1	6.6	7.1	30.7
Corrective cable: HV	6.3	6.7	7.1	7.5	7.9	35.5
Total	**11.5**	**12.4**	**13.2**	**14.1**	**15.0**	**66.2**

TABLE 6 UNDERGROUND CABLE SYSTEMS: VOLUMES (UNITS)

VOLUMES	FY27	FY28	FY29	FY30	FY31	TOTAL
Corrective cable: LV	76	76	76	76	76	380
Corrective cable: HV	231	231	231	231	231	1,157
Underground pits and pillars	362	388	413	438	463	2,063
Total	**670**	**695**	**720**	**745**	**770**	**3,600**

4.1.1 Fault and corrective forecasts

Given the random nature of underground cable failures, including the variable length of any corresponding cable replacements, our fault and corrective forecasts for underground cable systems are based on a simple average over the previous five-year period.

4.1.2 Top-down portfolio review

As a top-down consideration, we assessed our forecast relative to the implied age of replacement and the expected service life our population. Our annual forecast replacement rate equates to 0.4 per cent of our total cable population. This implies that on average, our underground cables will need to last over 263 years before we replace them. While we do not replace cables based on age, this suggests our forecast replacement volumes are likely 'no regrets' investments

4.2 Expenditure forecast

To develop expenditure forecasts for our underground cable systems, we have multiplied the forecast intervention volumes by observed unit rates for different cable types.

Table 7 summarises this expenditure forecast for the 2026–31 regulatory period.

TABLE 7 UNDERGROUND CABLE SYSTEMS: EXPENDITURE ($M, 2026)

EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
Corrective cable: LV	1.6	1.7	1.8	1.9	2.0	9.0
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