



# ASSET CLASS OVERVIEW

## POLE TOP STRUCTURES

PAL BUS 4.02 – PUBLIC  
2026–31 REGULATORY PROPOSAL

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# 1. Overview

Our pole top structure replacement program is critical to our ability to maintain network reliability and minimise safety risks as far as practicable in accordance with our legislated and regulatory obligations.

In the current regulatory period, our existing asset management approach for cross-arms has generally maintained network performance. Consistent with this, our forecast 'business-as-usual' intervention volumes for the 2026–31 regulatory period are lower than the corresponding replacements in the 2021–26 regulatory period.

Further, our annual forecast replacement rate equates to 1.4 per cent of our total cross-arm population. This implies that on average, our cross-arms will need to last 77 years before we replace them, which is higher than our observed cross-arm service life.

Our total forecast expenditure for the 2026–31 regulatory period, however, represents a small increase on the current period. This is driven by higher average units in the forecast period, and the inclusion of a risk-based replacement program targeting HV wooden cross-arms in high-risk bushfire locations (which is detailed in our separate bushfire mitigation overview business case, but included here to align with RIN reporting).<sup>1</sup>

A summary of our forecast expenditure for pole top structures for the 2026–31 regulatory period is set out in table 1.

**TABLE 1 FORECAST POLE TOP INTERVENTIONS: EXPENDITURE (\$M, 2026)**

EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
LV pole top replacement	21.7	26.2	26.4	23.3	25.1	122.7
HV pole top replacement	21.3	19.4	18.6	23.6	22.6	105.5
HV wood cross-arm replacements in HBRA	4.8	4.8	4.8	4.8	4.8	23.9
<b>TOTAL</b>	<b>47.8</b>	<b>50.4</b>	<b>49.8</b>	<b>51.7</b>	<b>52.4</b>	<b>252.1</b>

Note: HV pole top replacements include a small volume of sub-transmission replacements

<sup>1</sup> PAL BUS 3.11 – Bushfire mitigation forecast overview – Jan2025 – Public

## 2. Background

Pole top structures support our overhead conductors and low voltage (LV) service lines on poles.

Specifically, cross-arms are mounted horizontally on a pole to support insulator, overhead conductors, overhead service lines, LV components, high voltage (HV) fuses and other electrical equipment. Cross-arms are designed to ensure phase to phase clearance requirements are met.

This section provides an overview of our pole top structures 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 pole top structures asset class includes LV, HV and sub-transmission cross-arms. The corresponding material types used are wood and steel.

As shown in table 2, the majority of this asset class are LV wood or HV steel cross-arms.

**TABLE 2 CROSS-ARM POPULATION BY TYPE**

CROSS-ARM TYPE	WOOD	STEEL	TOTAL
LV	191,308	469	191,777
HV	33,403	291,544	324,947
Sub-transmission	728	39,145	39,873
<b>Total</b>	<b>225,439</b>	<b>331,158</b>	<b>556,597</b>

### 2.3 Asset age profile

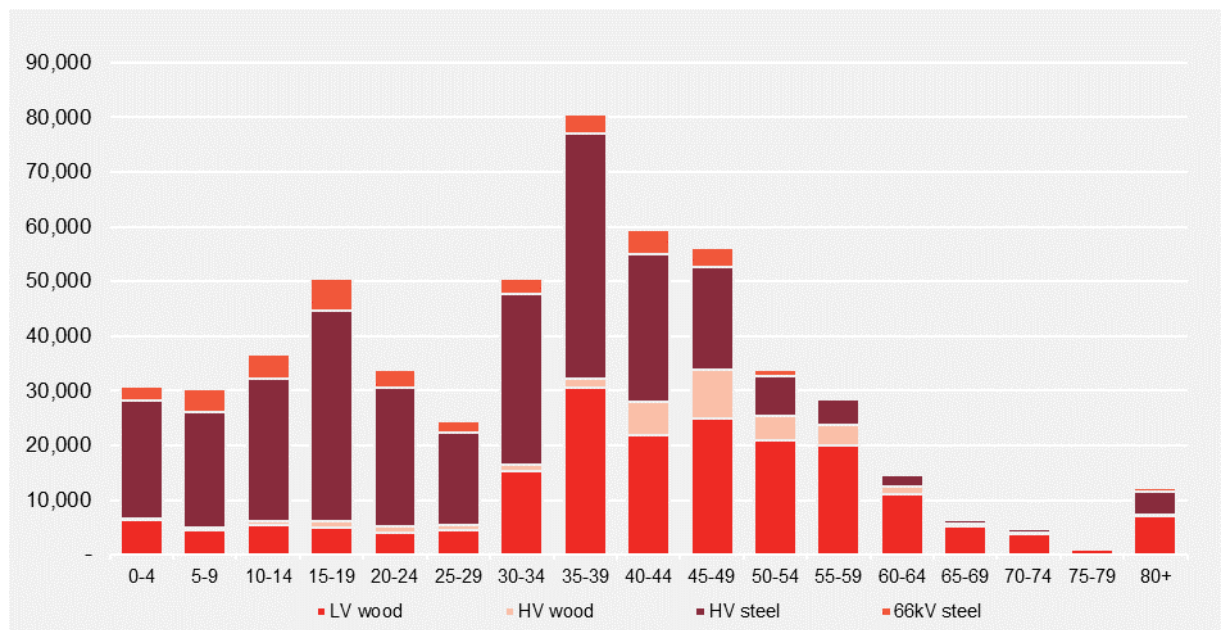
Table 3 sets out the expected service life for our different pole top asset types. Service life is the expected period of time after which the asset is unlikely to be fit for purpose, typically determined by safety, technology and/or obsolescence.

**TABLE 3 CROSS-ARM EXPECTED SERVICE LIFE (YEARS)**

CROSS-ARM TYPE	EXPECTED SERVICE LIFE
Wood cross-arm	50
Steel cross-arm	70

The corresponding age profile of our cross-arm asset population is shown in figure 1.

**FIGURE 1 NUMBER OF CROSS-ARMS BY MATERIAL AND AGE (YEARS)**



## 3. Identified need

The performance of our cross-arms 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 and potentially start a fire, particularly in electric line construction areas (ELCAs) and hazardous bushfire risk areas (HBRA).

The identified need, therefore, is to manage our cross-arm population to maintain reliability and minimise safety risks as far as practicable, consistent with our regulatory and legislative obligations.

This section outlines the historical performance of our cross-arms, which has informed how we assess (and respond, as required to) this identified need.

### 3.1 Historic asset performance

Consistent with our regulatory obligations, we inspect our cross-arms on serviceable poles located in HBRA every two to three years and every five years for cross-arms in low bushfire risk area (LBRA). We also inspect cross-arms on added control serviceable poles every year.<sup>2</sup> These cyclic inspections provide snapshots in time of the cross-arm condition and identify any defects.

In assessing the need to intervene on our cross-arm asset population, we monitor several asset performance indicators, including asset failures, high priority defects, and asset condition. These indicators inform our underlying asset management response—for example:

- increasing unassisted asset failures indicates a likely need to act immediately and review asset management practices (noting that robust inspection practices and governance over the application of these methods may drive low failure rates, but if the underlying condition of the relevant asset population is poor and/or deteriorating, high and/or increasing intervention volumes may still be prudent and efficient)
- increasing high-priority defects or deteriorating condition (relative to asset management thresholds) indicates a likely need to act soon to increase interventions over time, and/or undertake risk-based assessments.

As shown below, our existing asset management approach for cross-arms has generally maintained network reliability and minimised safety risks as far as practicable in the current regulatory period.

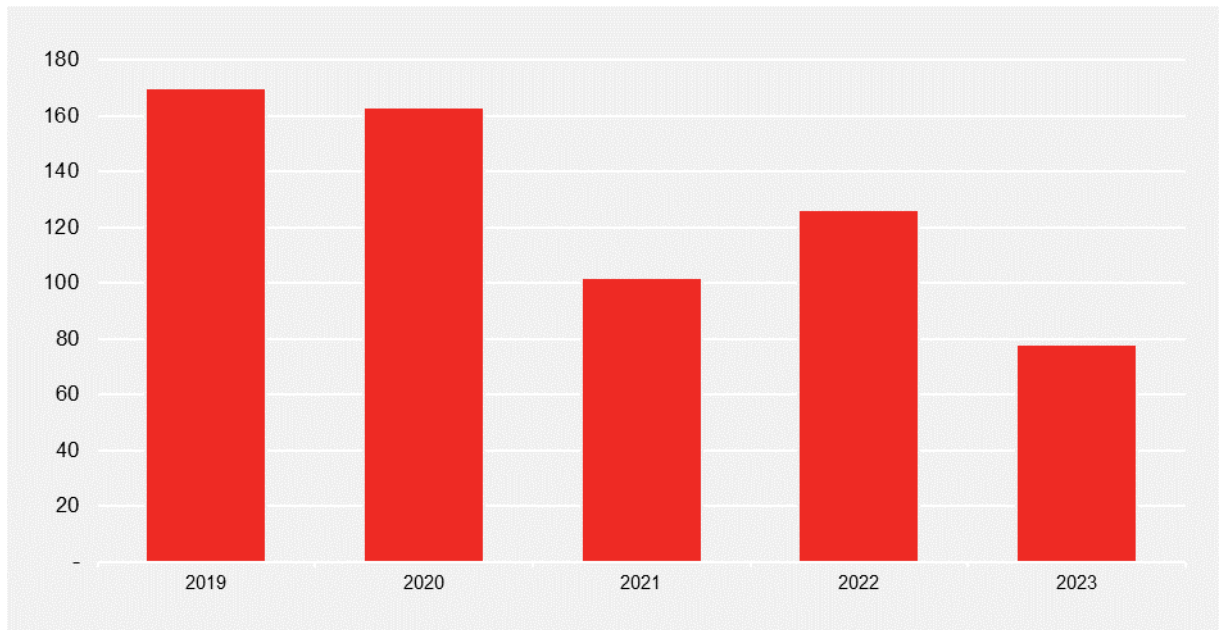
#### 3.1.1 Failures

Our cross-arm failures since 2019 are shown in figure 2.

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<sup>2</sup> Added control serviceable poles have reduced capacity and require additional controls.

**FIGURE 2 CROSS-ARM FAILURES**



### 3.1.2 Defects

Our response to identified defects depends on the nature and severity of the defect, and may include more frequent re-inspections. High priority defects that result in intervention are shown in table 4.

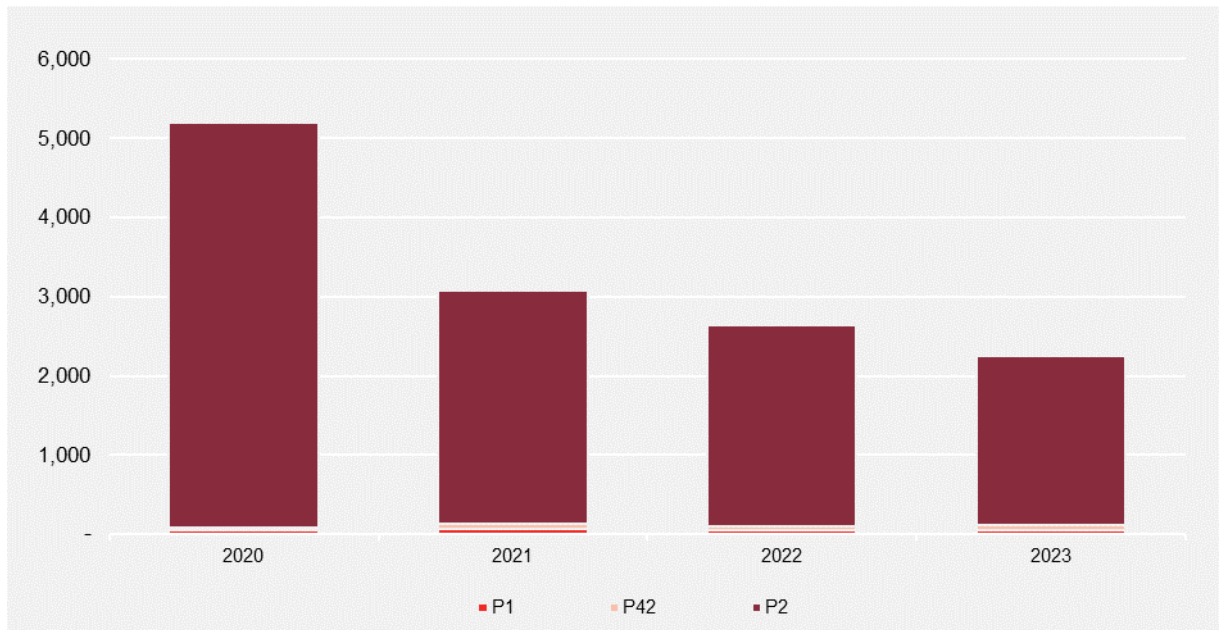
**TABLE 4 RESPONSE TIMEFRAMES FOR HIGH PRIORITY DEFECTS**

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

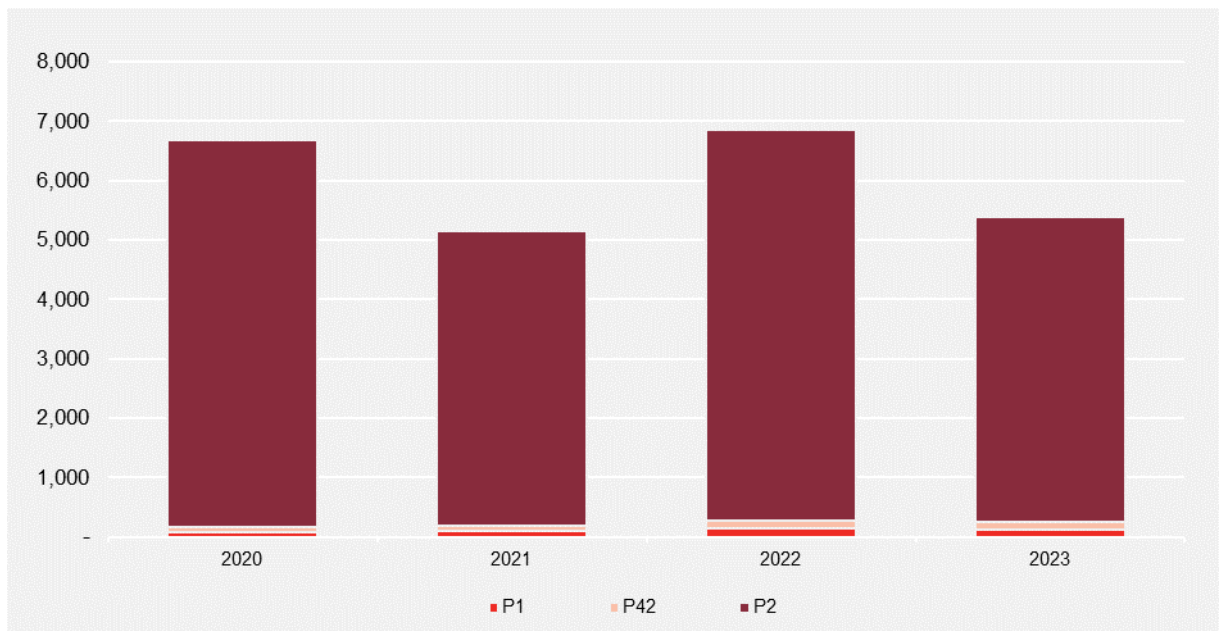
In 2020, we introduced a new inspection practice for cross-arms, where a pole top camera is used at all inspections. Pole top cameras were previously only used every five-years for cross-arms on serviceable poles and every two-years for cross-arms on added control serviceable poles.

To reflect the impact of this change in our inspection practice, figure 3 and figure 4 below show HV and LV cross-arm defects from 2020 onwards. The majority of these are P2 defects.

**FIGURE 3 HV CROSS-ARM DEFECTS**



**FIGURE 4 LV CROSS-ARM DEFECTS**



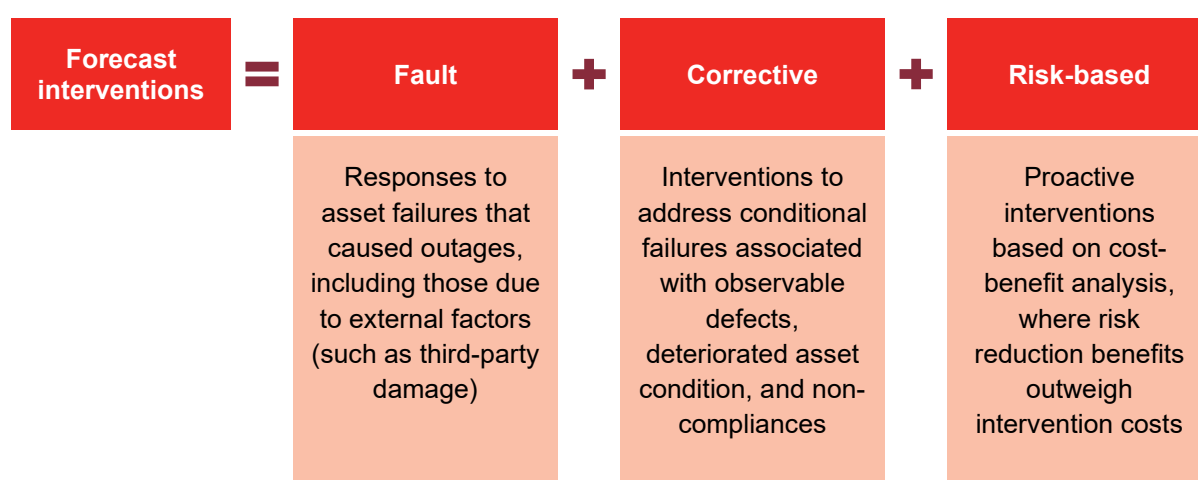


## 4. Forecast interventions

Our current asset management approach for pole top structures includes cyclic inspections and interventions, where required, to meet our required service levels consistent with our compliance obligations. Typically, the replacement of cross-arms is the only credible intervention response to defects and failures as refurbishment or repairs are not viable, and additional inspection and maintenance will not address the underlying asset condition.

The derivation of our forecast interventions for the 2026–31 regulatory period, for our high-volume asset, are based on three broad categories—faults, corrective and risk-based forecasts. This approach is summarised in figure 5, with further detail on each category provided below.

**FIGURE 5 FORECAST CATEGORIES**



### 4.1 Forecast volumes

For the 2026–31 regulatory period, a summary of our forecast volumes for cross-arms is shown in table 5. These comprise a combination of the forecast categories above, and converted into voltage level forecasts.

**TABLE 5 FORECAST POLE TOP INTERVENTIONS: VOLUMES**

VOLUMES	FY27	FY28	FY29	FY30	FY31	TOTAL
LV pole top replacement	3,980	4,853	4,892	4,288	4,630	22,645
HV pole top replacement	3,060	2,793	2,684	3,385	3,242	15,164
HV wood cross-arm replacements in HBRA	952	952	952	952	952	4,761
<b>Total</b>	<b>7,992</b>	<b>8,598</b>	<b>8,528</b>	<b>8,625</b>	<b>8,824</b>	<b>42,569</b>

Note: HV pole top replacements include a small volume of sub-transmission replacements

In total, excluding the risk-based HV wood cross-arm replacements in HBRA (which have a specific bushfire mitigation driver), our 'business-as-usual' forecast intervention volumes are slightly lower than in those completed in the 2021–26 regulatory period.

#### **4.1.1 Fault forecasts**

Faults, including from third-party damage, occur somewhat randomly across our network. Accordingly, our fault-based pole top intervention forecast is based on a simple average over the previous five-year period.

#### **4.1.2 Corrective forecasts**

Our corrective forecasts for cross-arm replacements are based on defect find rates and annual inspection volumes, consistent with independent statistical analysis on the best fit of our historical data.<sup>3</sup> These forecasts comprise the majority (over 80 per cent) of our total cross-arm intervention forecast.

Our defect find rate is the number of defects found per inspection conducted. Our defect find rate is derived from our historical average defect find rates since 2020 to reflect the impact of the new cross-arm inspection practice introduced in 2020 (as outlined in section 3.1.2). This rate excludes defective cross-arms that were replaced as part of our pole replacement program.

As our cross-arms are located across a large geographical diverse area, we have grouped our cross-arms into eight regions to account for any environmental factors that may influence our cross-arm condition.<sup>4</sup>

#### **4.1.3 Risk-based forecasts**

Our total cross-arm forecast includes a proactive risk-based program to replace HV wood cross-arms in HBRA that is part of our broader bushfire mitigation approach. This program brings forward the replacement of HV wood cross-arm in HBRA from the 2031–36 regulatory period to the 2026–31 regulatory period (i.e. in the absence of this program, these HBRA HV wood cross-arms would otherwise be considered as part of the corrective and fault replacement volumes in the 2031–36 regulatory period).

The driver and underlying analysis supporting this risk-based program is set out in our separate bushfire mitigation overview.<sup>5</sup> However, for completeness, the volumes and expenditure associated with this program are included in this asset class overview (noting that as this risk-based program results in the replacement of cross-arm assets, the corresponding volumes and costs are included in our pole top category replacement forecasts in the reset RIN).

#### **4.1.2 Top-down portfolio review**

As noted earlier, our 'business-as-usual' cross-arm intervention volume forecasts are lower than the corresponding intervention volumes in the current regulatory period.

As a further top-down consideration, our annual forecast replacement rate equates to 1.4 per cent of our total cross-arm population. This implies that on average, our cross-arms will need to last 77 years before we replace them, which is slightly higher than our observed cross-arm service life.

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<sup>3</sup> PAL ATT 4.02 – Simon Holcombe (Melbourne University) - EDPR defect forecasting methodology – Aug2024 – Public, pp. 16-18.

<sup>4</sup> The eight regions are Ballarat, Bendigo, Geelong, Horsham, Mildura, Shepparton, Sunshine and Warrnambool.

<sup>5</sup> PAL BUS 3.11 – Bushfire mitigation forecast overview – Jan2025 – Public

## 4.2 Expenditure forecast

To develop expenditure forecasts for our pole top structures asset class, we have multiplied the forecast intervention volumes by a volume-weighted average of the most recent unit rates derived from our audited RIN data.

Table 6 summarises this expenditure forecast for the 2026–31 regulatory period.

**TABLE 6 FORECAST POLE TOP INTERVENTIONS: EXPENDITURE (\$M, 2026)**

<b>EXPENDITURE</b>	<b>FY27</b>	<b>FY28</b>	<b>FY29</b>	<b>FY30</b>	<b>FY31</b>	<b>TOTAL</b>
LV pole top replacement	21.7	26.2	26.4	23.3	25.1	122.7
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