



RIN RePex Forecast Model Report

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Part of Energy Queensland

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1. PURPOSE AND SCOPE

The purpose of this document to illustrate the RIN RePex Forecast model that EQL uses to forecast replacement quantity and expenditure for the Submission RIN 2025-30. This model uses the past expenditure and SME knowledge as a base to perform the forecast.

2. DEFINITIONS, ABBREVIATIONS AND ACRONYMS

EQL	Energy Queensland Limited
AER	Australian Energy Regulator
RIN	Regulator Information Notice
CA RIN	Category Analysis Regulator Information Notice
P1 Defect	Priority 1 Defect
P2 Defect	Priority 2 Defect
RTS	Return to Service
SME	Subject Matter Expert

3. REFERENCES

- 2008 – 2023 Category Analysis RIN Data

4. INTRODUCTION

Energy Queensland Limited (EQL) owns two DNSP in Queensland, Ergon Energy and Energex which service 99% of Queensland (over one million square kilometres), supplying electricity to approximately over one million customers (444,889 in Ergon and 600,827 in Energex). In common with many electricity companies around the world, EQL is facing the challenge of managing ageing network assets in a demanding financial and regulatory environment

This report describes the flow of the RIN RePex Forecast model. It addresses the data sources and the logic for the model.

5. FORECASTING METHODOLOGY AND PROCESS

In this model, each tab carries different functions. This section will discuss the data source, logic and formulas in each tab.

The following tabs in the spreadsheets output the final AER Reset RIN template and business cases replacement volume and expenditure;

- Tab – “Summary”
- Tab – “Business Case Split”

The following tabs contain the historical RePex volume and expenditure and forecast of different replacement drivers;

- Tab – “Defect P1”
- Tab – “Defect P2”
- Tab – “RTS”
- Tab – “Planned”

- Tab – “Reconductor”

The following tab provide a place holder for the substation and sub transmission forecast;

- Substation

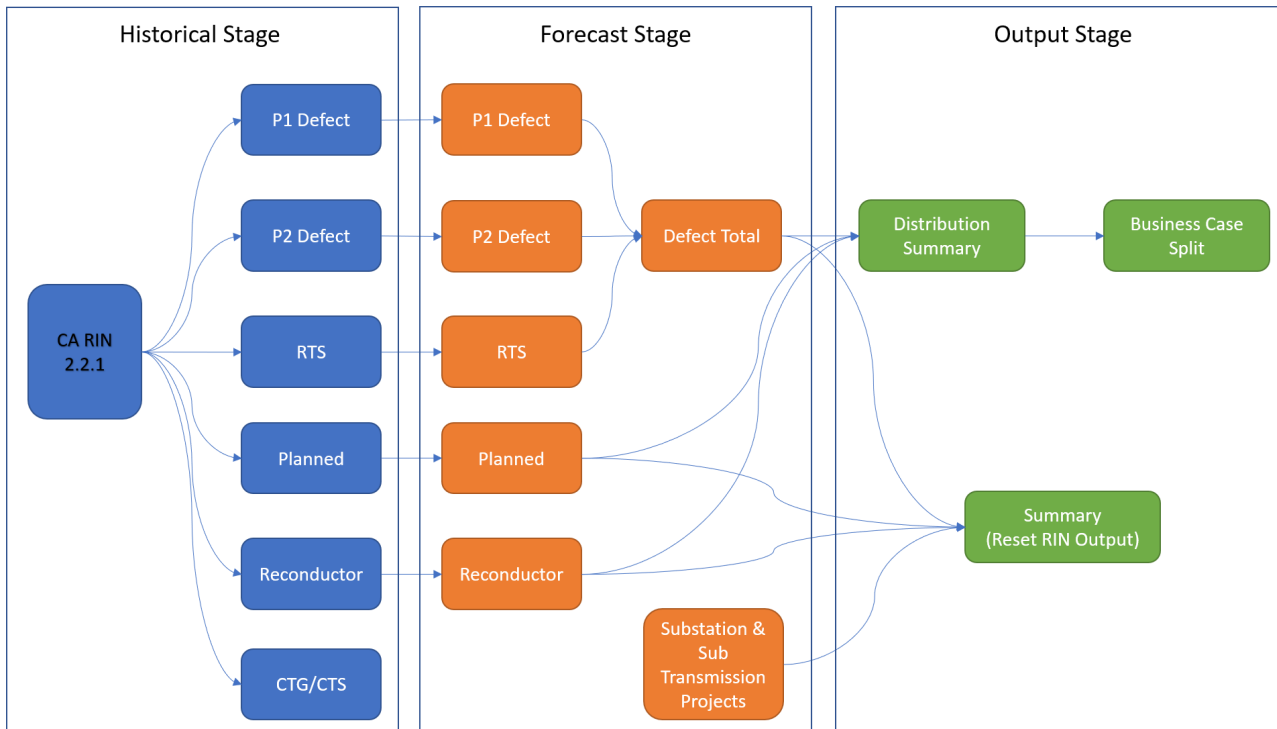


Figure 1 RIN RePex Forecast Model Flow Chart

5.1 RIN Backcast (Rosetta)

The RIN BackCast (Rosetta) tab consolidated the full history of AER Category Analysis RIN 2.2.1 from the Rosetta website. This included Replacement quantity, replacement expenditure and failure quantity. EQL provided these data by perform general ledger and store activity analysis. Further discussion and explanation can be found in the CA RIN Category Analysis RIN Basis of Preparation.

[Annual RINs reporting - 4. Ergon Energy Category Analysis RIN BOP 31 OCT 2023 Public_SOCI Act Redacted.pdf - All Documents \(sharepoint.com\)](#)

REPEX Code	ASSET GROUP	ASSET CATEGORY	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
			\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
A001	POLES BY: HIGH	Staking of a wooden pole	2,874,389	2,814,378	4,646,341	3,604,769	6,764,679	3,825,000	2,138,246	2,649,086	2,307,540	5,297,943	3,694,372	7,932,323	7,371,639	9,045,812	8,954,42
A002		<= 1 kV: Wood	816,795	1,128,185	2,472,283	2,721,425	3,529,756	3,488,000	4,551,605	4,778,141	6,572,772	12,016,646	15,981,217	29,700,802	31,189,088	33,585,766	33,333,811
A003		> 11 kV & <= 11 kV: Wood	765,782	1,057,724	2,317,883	2,551,464	3,309,307	3,270,000	4,574,736	4,800,567	2,483,620	12,514,761	15,163,178	22,880,398	26,216,795	21,888,782	26,139,66
A004		> 11 kV & <= 22 kV: Wood	2,425,184	3,349,750	7,340,588	8,080,319	10,480,366	10,357,000	15,199,753	15,953,302	18,246,434	12,514,761	15,163,178	22,880,398	26,216,795	21,888,782	26,139,66
A005		> 22 kV & <= 66 kV: Wood	1,435,066	1,433,421	2,669,083	3,412,789	5,614,111	4,814,000	7,409,112	4,446,818	5,082,090	4,531,096	6,486,921	10,367,822	10,330,814	7,534,581	9,230,78
A006		> 66 kV & <= 132 kV: Wood	0	0	0	0	0	0	0	0	0	76,770	157,459	503,127	385,307	121,625	148,66
A007		> 132 kV: Wood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A008		<= 1 kV: Concrete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A009		> 11 kV & <= 11 kV: Concrete	0	0	0	0	0	0	0	0	0	0	0	0	169,452	409,736	0
A010		> 11 kV & <= 22 kV: Concrete	0	6,411	0	0	18,040	0	8,041	0	0	0	0	0	0	13,076	51,313
A011		> 22 kV & <= 66 kV: Concrete	0	0	0	25,410	2,486,442	196,000	1,747,512	77,978	0	0	0	292,151	0	0	0
A012		> 66 kV & <= 132 kV: Concrete	0	0	0	0	0	0	0	0	0	0	0	0	48,110	143,352	62
A013		> 132 kV: Concrete	0	0	0	0	0	0	0	0	0	0	0	0	40,533	193,360	656,00
A014		<= 1 kV: Steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A015		> 11 kV & <= 11 kV: Steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,943
A016		> 11 kV & <= 22 kV: Steel	0	0	7,246	0	23,522	15,000	0	139,691	0	0	0	15,668	0	0	0
A017		> 22 kV & <= 66 kV: Steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A018		> 66 kV & <= 132 kV: Steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A019		> 132 kV: Steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 2 RIN BackCast (Rosetta)

5.2 RIN 2.12 2022-2023 REPEX

The RIN 2.12 2022-2023 REPEX tab recorded the expenditure split from 2022-2023 CA RIN 2.12.

- Direct Material
- Direct Labour
- Contract
- Other

This tab calculated the percentage split for each asset class in the above expenditure types. This result were utilised in resources reduction risk analysis.

2.12.1 - INPUT TABLES		DIRECT MATERIAL	DIRECT LABOUR	CONTRACT	OTHER	DIRECT MATERIAL	DIRECT LABOUR	CONTRACT	OTHER
		EXPENDITURE (\$0's)				EXPENDITURE (%)			
		2022-23	2022-23	2022-23	2022-23	2022-23	2022-23	2022-23	2022-23
REPLACEMENT	Pole	20,223,804	24,973,117	49,237,301	1,163,847	21.16%	26.12%	51.50%	1.22%
	Pole top structure	13,348,919	22,173,115	29,580,016	1,169,643	20.14%	33.46%	44.63%	1.76%
	Overhead conductor	11,443,871	13,496,808	27,604,466	935,083	21.40%	25.24%	51.62%	1.75%
	Underground cable	1,268,863	3,404,904	1,671,804	70,906	19.78%	53.07%	26.05%	1.11%
	Services	4,971,836	10,417,761	13,018,387	621,027	17.13%	35.89%	44.85%	2.14%
	Transformer	22,053,848	25,573,057	20,788,368	690,185	31.91%	37.01%	30.08%	1.00%
	Switchgear	19,008,031	28,392,824	26,407,502	1,429,965	25.26%	37.74%	35.10%	1.90%

Figure 3 RIN 2.1 2022-2023 REPEX

5.3 Defect

The Defect P1, Defect P2 and RTS tabs recorded the replace quantity and expenditure in each AER prescribed asset categories under the three defect modes (3 tabs).

- "Defect P1" – Priority 1 replacement
- "Defect P2" – Priority 2 replacement
- "RTS" – Return to service (fail in service replacement)

These three tabs recorded the replacement quantity and expenditure with the three different defect drivers which recorded in the CA RIN 2.2.1 reporting exercise through the years. In practice, these three replacement modes require different resource, cost, labour and unit cost rate.

Group	Cat	P1 DEFECTS	ALLOCATED COSTS							
Cod	Code	RIN ASSET CATEGORY	2013	2014	2015	2016	2017	2018	2019	2020
A1	A001	Staking of a wooden pole	40,146	183,119	48,215	82,297	58,928	0	24,323	0
A	A002	<= 1 kV; Wood	858,933	1,460,320	1,335,296	2,005,062	1,874,615	795,597	405,772	14,290
A	A003	> 1 kV & <= 11 kV; Wood	719,820	1,067,589	1,142,186	1,840,344	1,908,460	3,625,664	2,643,614	0
A	A004	> 11 kV & <= 22 kV; Wood	719,820	1,067,589	1,142,186	1,840,344	1,908,460	317,374	0	0
A	A005	> 22 kV & <= 66 kV; Wood	359,458	648,774	277,676	598,018	423,842	0	449,656	175
A	A006	> 66 kV & <= 132 kV; Wood	16,998	0	0	0	0	707,310	20,008	0
A	A007	> 132 kV; Wood	0	0	0	0	0	0	0	0
A	A008	<= 1 kV; Concrete	0	0	0	0	0	0	0	0
A	A009	> 1 kV & <= 11 kV; Concrete	0	0	0	0	0	0	0	0
A	A010	> 11 kV & <= 22 kV; Concrete	0	0	0	0	0	0	0	0
A	A011	> 22 kV & <= 66 kV; Concrete	0	0	0	0	0	0	0	0

Figure 4 Defect P1

5.3.1 Replacement Rate and Unit Cost Rate

In the above mentioned 3 tabs, we have calculated the replacement rate and unit cost rate for each asset category;

- o Annual rate from 2013/14 to 2022/23
- o Last 5 years average
- o Last 3 years average
- o Last year

Group	Cat	P2 DEFECTS	AVERAGE REPLACEMENT UNITS		
Cod	Code	RIN ASSET CATEGORY	Avg 5 Y	Avg 3 Y	Last Y
A1	A001	Staking of a wooden pole	4,014	4,658	4,260
A	A002	<= 1 kV; Wood	2,368	2,529	2,517
A	A003	> 1 kV & <= 11 kV; Wood	7,208	8,868	7,499
A	A004	> 11 kV & <= 22 kV; Wood	71	0	0
A	A005	> 22 kV & <= 66 kV; Wood	422	581	506
A	A006	> 66 kV & <= 132 kV; Wood	8	9	4
A	A007	> 132 kV; Wood	0	0	0
A	A008	<= 1 kV; Concrete	0	0	0
A	A009	> 1 kV & <= 11 kV; Concrete	5	9	0
A	A010	> 11 kV & <= 22 kV; Concrete	0	0	0
A	A011	> 22 kV & <= 66 kV; Concrete	0	0	0
A	A012	> 66 kV & <= 132 kV; Concrete	0	0	0
A	A013	> 132 kV; Concrete	0	0	0
A	A014	<= 1 kV; Steel	0	0	0

Figure 5 Defect P2 - Average Replacement Rate

5.3.2 Replacement Quantity Forecast

There are 2 different types of forecast method in this model, historical based and manual forecast.

With the historical based, there are following options to change the replacement rate;

- o Starting year
- o Base case – 3 years average, 5 years average and last year replacement rate
- o Type of change – step, compound and linear
- o Applying percentage

With manual mode, the manual input will override the historical based scenario. This was used to represent special program or known issue need to be rectified.

Group	Cat	P2 DEFECTS	AVERAGE UNIT COST RATES				Data %												Manual Qty								
			Code	RIN ASSET CATEGORY	Avg 5 Y	Avg 3 Y	Last Y	Start Y	Increase	%	2022/2	2023/2	2024/2	2025/2	2026/2	2027/2	2028/2	2029/2	2022/2	2023/2	2024/2	2025/2	2026/2	2027/2	2028/2	2029/2	
A1	A001	Staking of a wooden pole		1,554	1,401	1,659	2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A002	<= 1 kV; Wood		4,111	4,155	5,522	2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A003	> 1 kV & <= 11 kV; Wood		6,348	6,398	6,689	2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A004	> 11 kV & <= 22 kV; Wood		12,938			2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A005	> 22 kV & <= 66 kV; Wood		11,200	11,007	15,660	2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A006	> 66 kV & <= 132 kV; Wood		161,178	13,372	12,739	2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A007	> 132 kV; Wood					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A008	<= 1 kV; Concrete					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A009	> 1 kV & <= 11 kV; Concrete		6,595	6,595		2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A010	> 11 kV & <= 22 kV; Concrete					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A011	> 22 kV & <= 66 kV; Concrete					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A012	> 66 kV & <= 132 kV; Concrete					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A015	> 1 kV & <= 11 kV; Steel					2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											
A	A018	> 11 kV & <= 22 kV; Steel		15,675			2023/26	Step	0%	100%	100%	100%	100%	100%	100%	100%											

Group	Cat	P2 DEFECTS	Forecast Unit									
			Code	RIN ASSET CATEGORY	2022/2	2023/2	2024/2	2025/2	2026/2	2027/2	2028/2	2029/2
A1	A001	Staking of a wooden pole			4,658	4,658	4,658	4,658	4,658	4,658	4,658	4,658
A	A002	<= 1 kV; Wood			2,529	2,529	2,529	2,529	2,529	2,529	2,529	2,529
A	A003	> 1 kV & <= 11 kV; Wood			8,868	8,868	8,868	8,868	8,868	8,868	8,868	8,868
A	A004	> 11 kV & <= 22 kV; Wood			0	0	0	0	0	0	0	0
A	A005	> 22 kV & <= 66 kV; Wood			581	581	581	581	581	581	581	581
A	A006	> 66 kV & <= 132 kV; Wood			9	9	9	9	9	9	9	9
A	A007	> 132 kV; Wood			0	0	0	0	0	0	0	0
A	A008	<= 1 kV; Concrete			0	0	0	0	0	0	0	0
A	A009	> 1 kV & <= 11 kV; Concrete			9	9	9	9	9	9	9	9
A	A010	> 11 kV & <= 22 kV; Concrete			0	0	0	0	0	0	0	0
A	A011	> 22 kV & <= 66 kV; Concrete			0	0	0	0	0	0	0	0
A	A012	> 66 kV & <= 132 kV; Concrete			0	0	0	0	0	0	0	0

Figure 6 Defect P2 - Replacement Quantity Forecast

5.3.3 Replacement Unit Cost Rate

Similar to the replacement quantity, there were 2 different types of unit cost rate forecast, historical based and manual forecast.

With the historical based mode, there were two parameters to change the unit cost rate;

- o Base case – 5 years average, 3 years average and last year replacement rate
- o Escalation percentage

With manual, the new input will override the historical based scenario.

Group	Cat	P2 DEFECTS	UNIT COST RATE					
			Code	RIN ASSET CATEGORY	Type	Escalat	Manua	APPLIE
A1	A001	Staking of a wooden pole			Avg 3 Yr	0%	1,800	1,800
A	A002	<= 1 kV; Wood			Avg 3 Yr	5%		4,155
A	A003	> 1 kV & <= 11 kV; Wood			Avg 3 Yr	5%		6,398
A	A004	> 11 kV & <= 22 kV; Wood			Avg 5 Yr	5%		12,938
A	A005	> 22 kV & <= 66 kV; Wood			Avg 3 Yr	5%		11,007
A	A006	> 66 kV & <= 132 kV; Wood			Avg 3 Yr	5%		13,372
A	A007	> 132 kV; Wood			Avg 3 Yr	5%		
A	A008	<= 1 kV; Concrete			Avg 3 Yr	5%		
A	A009	> 1 kV & <= 11 kV; Concrete			Avg 3 Yr	5%		6,595
A	A010	> 11 kV & <= 22 kV; Concrete			Avg 3 Yr	5%		
A	A011	> 22 kV & <= 66 kV; Concrete			Avg 3 Yr	5%		
A	A012	> 66 kV & <= 132 kV; Concrete			Avg 3 Yr	5%		
A	A013	> 132 kV; Concrete			Avg 3 Yr	5%		

Figure 7 Defect P2 - Replacement Unit Cost Rate

5.3.4 Replacement Expenditure Forecast

The replacement expenditure was calculated by the multiplying the forecast quantity with the forecast unit cost rate for every asset category in each year.

Group	Cat	P2 DEFECTS	2023	2024	2025	2026	2027	2028	2029
Cod	Code	RIN ASSET CATEGORY							
A1	A001	Staking of a wooden pole	8,384,400	8,384,400	8,384,400	8,384,400	8,384,400	8,384,400	8,384,400
A	A002	<= 1 kV; Wood	10,505,639	10,505,639	10,505,639	10,505,639	10,505,639	10,505,639	10,505,639
A	A003	> 1 kV & <= 11 kV; Wood	56,731,941	56,731,941	56,731,941	56,731,941	56,731,941	56,731,941	56,731,941
A	A004	> 11 kV & <= 22 kV; Wood	0	0	0	0	0	0	0
A	A005	> 22 kV & <= 66 kV; Wood	6,391,394	6,391,394	6,391,394	6,391,394	6,391,394	6,391,394	6,391,394
A	A006	> 66 kV & <= 132 kV; Wood	115,894	115,894	115,894	115,894	115,894	115,894	115,894
A	A007	> 132 kV; Wood							
A	A008	<= 1 kV; Concrete							
A	A009	> 1 kV & <= 11 kV; Concrete	57,161	57,161	57,161	57,161	57,161	57,161	57,161
A	A010	> 11 kV & <= 22 kV; Concrete							
A	A011	> 22 kV & <= 66 kV; Concrete							

Figure 8 Defect P2 - Replacement Expenditure Forecast

5.4 Defect Total

The Defect Total tab summarised the Defect P1, Defect P2 and RTS by summing up replacement quantity and expenditure for each asset categories in each year.

Group	Cat	RETURN TO SERVICE	2022	2023	2024	2025	2026	2027	2028	2029	UNIT RATE
Cod	Code	RIN ASSET CATEGORY									Calculat
A1	A001	Staking of a wooden pole	4,658	4,658	4,658	4,658	4,658	4,658	4,658	4,658	1,800
A	A002	<= 1 kV; Wood	2,599	2,599	2,599	2,599	2,599	2,599	2,599	2,599	4,254
A	A003	> 1 kV & <= 11 kV; Wood	9,090	9,090	9,090	9,090	9,090	9,090	9,090	9,090	6,241
A	A004	> 11 kV & <= 22 kV; Wood	7	7	7	7	7	7	7	7	9,335
A	A005	> 22 kV & <= 66 kV; Wood	591	591	591	591	591	591	591	591	10,823
A	A006	> 66 kV & <= 132 kV; Wood	9	9	9	9	9	9	9	9	13,071
A	A007	> 132 kV; Wood	0	0	0	0	0	0	0	0	
A	A008	<= 1 kV; Concrete	0	0	0	0	0	0	0	0	
A	A009	> 1 kV & <= 11 kV; Concrete	9	9	9	9	9	9	9	9	6,595
A	A010	> 11 kV & <= 22 kV; Concrete	0	0	0	0	0	0	0	0	
A	A011	> 22 kV & <= 66 kV; Concrete	0	0	0	0	0	0	0	0	
A	A012	> 66 kV & <= 132 kV; Concrete	0	0	0	0	0	0	0	0	
A	A013	> 132 kV; Concrete	0	0	0	0	0	0	0	0	
A	A014	<= 1 kV; Steel	0	0	0	0	0	0	0	0	

Figure 9 Defect Total

5.5 Planned

The Planned tab recorded the planned project replacement quantity and expenditure. Similar to the defect tabs, it used the CA RIN exercise result to extract historical data.

Group	Cat	Planned DEFECTS	Manual Qty						
Cod	Code	RIN ASSET CATEGORY	2022/2	2023/2	2024/2	2025/2	2026/2	2027/2	20
A1	A001	Staking of a wooden pole	0	0	0	0	0	0	0
A	A002	<= 1 kV; Wood	0	0	0	0	0	0	0
A	A003	> 1 kV & <= 11 kV; Wood	0	0	0	0	0	0	0
A	A004	> 11 kV & <= 22 kV; Wood	0	0	0	0	0	0	0
A	A005	> 22 kV & <= 66 kV; Wood	0	0	0	0	0	0	0
A	A006	> 66 kV & <= 132 kV; Wood	0	0	0	0	0	0	0
A	A007	> 132 kV; Wood	0	0	0	0	0	0	0
A	A008	<= 1 kV; Concrete	0	0	0	0	0	0	0
A	A009	> 1 kV & <= 11 kV; Concrete	0	0	0	0	0	0	0
A	A010	> 11 kV & <= 22 kV; Concrete	0	0	0	0	0	0	0
A	A011	> 22 kV & <= 66 kV; Concrete	0	0	0	0	0	0	0
A	A012	> 66 kV & <= 132 kV; Concrete	0	0	0	0	0	0	0
A	A013	> 132 kV; Concrete	0	0	0	0	0	0	0
A	A014	<= 1 kV; Steel	0	0	0	0	0	0	0

Figure 10 Planned

5.5.1 Replacement Rate and Unit Cost Rate

This tab calculated the following replacement rate and unit cost rate for each category under planned replacement;

- Annual rate from 2013/14 to 2022/23
- Last 5 years average
- Last 3 years average
- Last year

5.5.2 Replacement Quantity Forecast

Similar to Defect tabs, there are 2 different types of forecast method in this model, historical based and manual forecast. In the Planned Tab, the manual function was used to record all planned replacement program, excluding conductor replacement. The following programs had been recorded in this tab;

- Poletop structure replacement program
- Services replacement program
- Towers replacement program

Group	Cat	Planned DEFECTS	Manual Qty							Base Case		
			2022/2	2023/2	2024/2	2025/2	2026/2	2027/2	2028/2	2029/3		
A1	A001	Staking of a wooden pole	0	0	0	0	0	0	0	0	Avg 3 Yr	0
B	B001	<= 1 kV				2,468	2,468	2,468	2,468	2,468	Avg 3 Yr	128
B	B002	> 1 kV & <= 11 kV				1,372	1,372	1,372	1,372	1,372	Avg 3 Yr	62
B	B003	> 11 kV & <= 22 kV				405	405	405	405	405	Avg 3 Yr	21
B	B004	> 22 kV & <= 66 kV				2,754	2,754	2,754	2,754	2,754	Avg 3 Yr	104
B	B005	> 66 kV & <= 132 kV									Avg 3 Yr	0
B	B006	> 132 kV									Avg 3 Yr	0
B	B007	Pole Tops Other									Avg 3 Yr	0

Figure 11 Planned - Planned Poletop Replacement Program

5.5.3 Replacement Unit Cost Rate

Similar to the replacement quantity, there are 2 different types of unit cost rate forecast, historical based and manual forecast.

With the historical based, there are following options and parameters to change the unit cost rate;

- Base case – 3 years average, 5 years average and last year replacement rate
- Escalation percentage

With manual, the new input will override the historical based scenario.

5.5.4 Replacement Expenditure Forecast

The replacement expenditure was calculated by the multiplying the forecast quantity with the forecast unit cost rate for every asset category in each year.

5.6 Reconductor

The Reconstructor tab recorded the reconductor project replacement quantity and expenditure. Similar to the defect and planned tabs, it used the 2018-2023 CA RIN exercise result to extract project data.

5.6.1 Replacement Rate and Unit Cost Rate

This tab calculated the following replacement rate and unit cost rate for each category under reconductor replacement;

- Annual rate from 2013/14 to 2022/23
- Last 5 years average
- Last 3 years average
- Last year

5.6.2 Replacement Quantity Forecast

Similar to Defect tabs, there are 2 different types of forecast method in this model, historical based and manual forecast. In the Planned Tab, only manual function was used to record reconductor program including the consequential replacement during the conductor replacement, e.g. pole, poletop, overhead service, distribution transformer and switch.

5.6.3 Replacement Unit Cost Rate

Similar to the replacement quantity, there are 2 different types of unit cost rate forecast, historical based and manual forecast.

With the historical based, there are following options and parameters to change the unit cost rate;

- Base case – 3 years average, 5 years average and last year replacement rate
- Escalation percentage

With manual, the new input will override the historical based scenario. This was usually input with special program or known issue need to be rectified.

Last 3 years average with 5% escalation was used in the Reconstructor tab.

5.6.4 Replacement Expenditure Forecast

The replacement expenditure was calculated by the multiplying the forecast quantity with the forecast unit cost rate for every asset category in each year.

5.7 CTGS

The CTGS tab recorded the reconductor project replacement quantity and expenditure. Similar to the defect and planned tabs, it used the 2018-2023 CA RIN exercise result to extract project data. This recorded Clear to Ground (CTG) and Clear to Structure (CTS) activity. The CTG and GTS

program started in 2014/15 as RePex and transited to Augmentation in 2021/22. This CTGS tab was only used as historical RePex recording, not providing any forecast value.

The replacement rate, unit cost rate and forecast logic were similar to defect and plan can be referred to the above.

5.8 Substation

The Substation tab provided data place holder for the EE Substation Project Analysis model. The Substation Project Analysis model counted and calculated the substation projects' replacement quantity and expenditure into the CA RIN prescribed categories.

The Substation Project Analysis model was using in the CA RIN reporting exercise. Further explanation and discussion can be found in the CA RIN Basis of Preparation 2.2 Repex Step 3(a) and 3(c).

[Annual RINs reporting - 4. Ergon Energy Category Analysis RIN BOP 31 OCT 2023 Public SOCI Act Redacted.pdf - All Documents \(sharepoint.com\)](#)

5.9 Summary

The Summary tab provided the following components in consolidated view from the Defect (Total), Planned, Reconductor, CTGS and Substation tabs;

- Historical replacement quantity and expenditure
- Forecast replacement quantity and expenditure
- Consolidated unit cost rate

5.10 Distribution Summary

The Distribution Summary tab was similar to the Summary tab but excluding substation and sub transmission specified investment.

The purpose of this tab was to provide the following without interference with sub transmission projects;

- consolidated view of distribution asset only
- replacement quantity and expenditure in distribution asset investment
- homogenise 5 years (2025/26 – 2029/30) average unit cost rate for modelling purpose.

5.11 Business Case Split

The purpose of Business Case Split tab is to provide a view for business case and predictive modelling purpose. This view was driven by replacement quantity and followed by combining with the unit cost rate which generated from Distribution Summary tab. The following business cases were included in this tab;

- Pole,
- Poletop,

- o Conductor,
- o Underground cable,
- o Overhead services,
- o Distribution transformers,
- o Distribution switches and
- o Towers

Group	Cod	BC	BC Natul	RIN ASSET CATEGORY	2025	2026	2027	2028	2029	UNIT RATE	Calculat				
											2025	2026	2027	2028	2029
A1	Cond	Defect		Nails						1,800	0	0	0	0	0
A	Cond	Defect		Poles	339	339	339	339	339	6,236	2,114,105	2,114,105	2,114,105	2,114,105	2,114,105
B	Cond	Defect		Pole Tops	681	681	681	681	681	2,811	1,913,983	1,913,983	1,913,983	1,913,983	1,913,983
C	Cond	Defect		Conductor	94	94	94	94	94	56,912	5,322,448	5,322,448	5,322,448	5,322,448	5,322,448
D	Cond	Defect		Underground Cables	0	0	0	0	0	322,728	0	0	0	0	0
E	Cond	Defect		Services	367	367	367	367	367	1,339	491,815	491,815	491,815	491,815	491,815
F	Cond	Defect		Transformers	35	35	35	35	35	29,244	1,027,851	1,027,851	1,027,851	1,027,851	1,027,851
G	Cond	Defect		Switchgear	37	37	37	37	37	9,415	352,626	352,626	352,626	352,626	352,626
H	Cond	Defect		Public Lighting						0	0	0	0	0	0
I	Cond	Defect		SCADA, Protection & Control						0	0	0	0	0	0
J	Cond	Defect		Other						30,000	0	0	0	0	0
A1	Cond	Proactive		Nails	0	0	0	0	0	1,800	0	0	0	0	0
A	Cond	Proactive		Poles	2,199	2,307	2,380	2,452	2,489	6,236	13,710,630	14,388,805	14,840,922	15,293,038	15,519,097
B	Cond	Proactive		Pole Tops	4,416	4,635	4,781	4,926	4,999	2,811	12,412,773	13,026,752	13,436,071	13,845,390	14,050,049
C	Cond	Proactive		Conductor	607	637	657	677	687	56,912	34,517,726	36,225,091	37,363,335	38,501,579	39,070,701
D	Cond	Proactive		Underground Cables	0	0	0	0	0	322,728	0	0	0	0	0
E	Cond	Proactive		Services	2,382	2,499	2,578	2,656	2,696	1,339	3,189,572	3,347,339	3,452,517	3,557,695	3,610,284
F	Cond	Proactive		Transformers	229	240	248	255	259	29,244	6,695,178	7,024,898	7,244,712	7,464,525	7,574,432
G	Cond	Proactive		Switchgear	243	255	263	271	275	9,415	2,286,888	2,400,006	2,475,417	2,550,829	2,588,535
H	Cond	Proactive		Public Lighting						0	0	0	0	0	0
I	Cond	Proactive		SCADA, Protection & Control						0	0	0	0	0	0
J	Cond	Proactive		Other						30,000	0	0	0	0	0
G	Cond	Defect		Fuse	70	70	70	70	70	10,094	709,534	709,534	709,534	709,534	709,534
G	Cond	Proactive		Fuse	348	456	478	493	508	10,094	3,509,932	4,601,549	4,829,157	4,980,896	5,132,635

Figure 12 Business Case Split