31 January 2023

Attachment 5.10.a - Elevated work platform program

Ausgrid's 2024-29 Regulatory Proposal

Empowering communities for a resilient, affordable and net-zero future.

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1. Document governance

1.1. Purpose of this document

The purpose of this document is to outline a business case for Ausgrid's elevated work platform (**EWP**) replacement program that may, subject to investment governance processes, form part of Ausgrid's 2024-29 regulatory proposal.

Related documents

Document	Version	Author
Fleet Strategy – 2024-29 Regulatory Proposal Support Document	V1.0	Tim Kynoch
Fleet Capital Expenditure Strategy – Benefits Assessment Approach	V1.0	Craig Calder
Ausgrid Fleet NPV Model	Final	Ernst & Young

Document history

Date	Version	Comment	Person
15/2/2022	V0.1	Initial draft	Damon Taylor
29/4/2022	V0.2	Second draft	Damon Taylor
22/7/2022	V0.3	Third draft	Damon Taylor
13/9/2022	V0.8	Fourth draft	Damon Taylor
12/10/2022	V1.0	First version	Damon Taylor

Approval(s)

Name	Position	Date
Kelly Wood	EGM Network Delivery Services	

2. Executive summary

The table below provides a summary of Ausgrid's EWP replacement program business case. It provides a recommendation derived from analysis of four options overall, informed by Ausgrid's experience in operating EWPs over the last three regulatory periods (2019-24, 2014-19, 2009-14). The proposed program of work, if approved, would deliver net benefits of $30.7 million based on our net present value (**NPV**) modelling.

Executive summary							
Key objective(s) of the program	Ausgrid's fleet capex program is focused on improving employee safety, standardising vehicle types to obtain improved pricing, optimising through-life costs, and improving fleet capability, utilisation and sustainability. Ausgrid's EWP fleet was predominantly purchased during the 2009-14 regulatory period to support the significant period of network capital construction that took place at that time. With a technical life of 15 years and a current average age in excess of 10 years, the 2024-29 program for EWPs will renew 110 assets (out of a total of 179) that have reached end of determined useful life by introducing smaller, more agile platforms better suited to current maintenance and capital work profiles. Failure to replace EWPs would result in a requirement to conduct an additional major inspection (rebuild) on each asset as it reaches 15 years of service life. Adopting such a strategy is not considered acceptable due to the capital expenditure required and the immaterial benefit it would have on reliability, productivity, employee and public safety and operating costs.						
Key benefits	• Increased employee and public safety • Increased employee productivity • Reduced operating costs • Reduced carbon emissions						
Compliance requirements	Ausgrid Fleet Replacement Guidelines stipulate that the technical life for EWP assets is 15 years. Notably, relevant Australian Standards AS 1418 and AS 2550 presribe that these assets require major inspections at 10 years and every subsequent 5 years of service life in order to remain compliant.						
Recommended Option & Rationale	Option 2: BAU Replacement • Unlocks second most net economic benefits of options assessed • Represents an appropriate balance of capital investment, operating cost reduction, and capital delivery risk						
Market NPV	$30.7 million						
Expenditure forecast	**($M Real, FY24)**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**Total**
	CAPEX	14.1	12.4	12.5	12.7	12.4	**64.2**
	OPEX benefits	0.7	1.4	2.2	2.9	3.7	**10.8**
	CAPEX benefits	1.1	1.2	1.3	1.4	1.3	**6.3**

3. CONTEXT

3.1. Background

Ausgrid's fleet of EWPs, which comprise both plant and underlying vehicle chassis, supports the efficient delivery of maintenance and capital works on the overhead network. The vast majority of the EWP fleet was purchased across a 5 year period beginning in 2010 to support the significant period of network capital construction and replacement that took place at that time.

Ausgrid's Fleet Replacement Guidelines stipulate that these assets have a technical life of 15 years. The 2024-29 program for EWPs aims to renew existing assets that have reached end of determined useful life by introducing smaller, more agile platforms better suited to current maintenance and capital work profiles..

3.2. Problem / Opportunity

With an average age in excess of 10 years across 179 individual assets (see **Figure 1** and **Figure 2** below), a significant number of Ausgrid's EWP assets are rapidly approaching the end of their determined useful life of 15 years.

The subsequent requirement to replace such a large number of assets in a short period of time creates significant deliverability risk, not only in terms of the market's ability to respond to such demand but in terms of the impacts any potential delay may have on Ausgrid's compliance with relevant Australian Standards and network capital delivery.

Figure 1 – EWPs by Age and Count

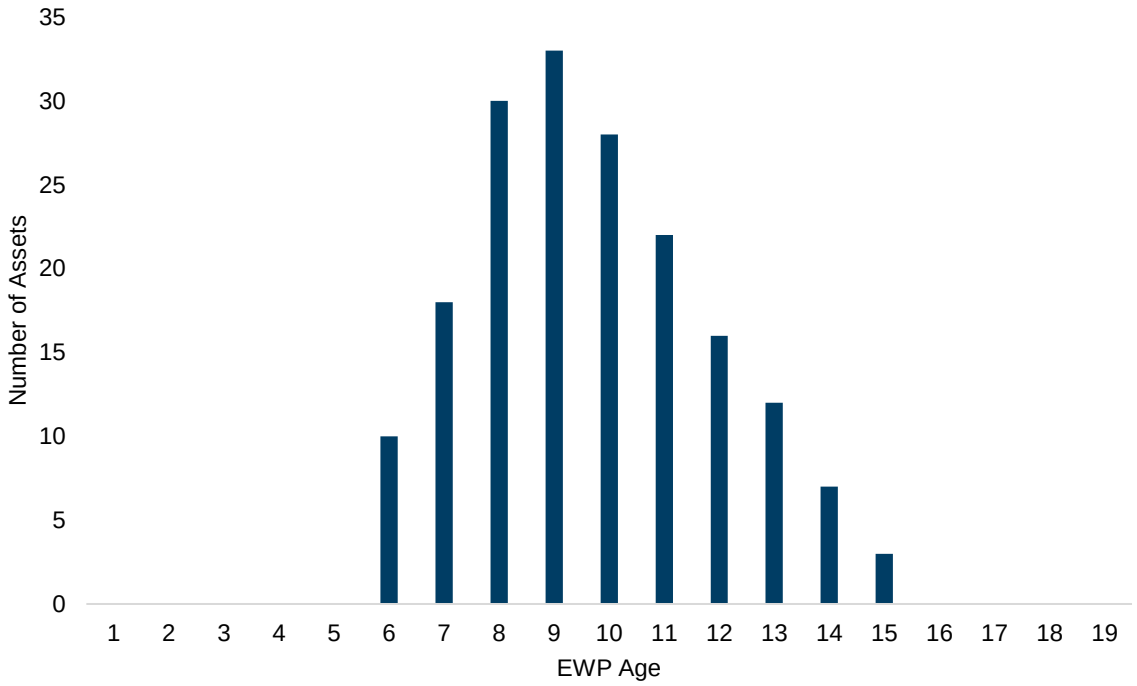
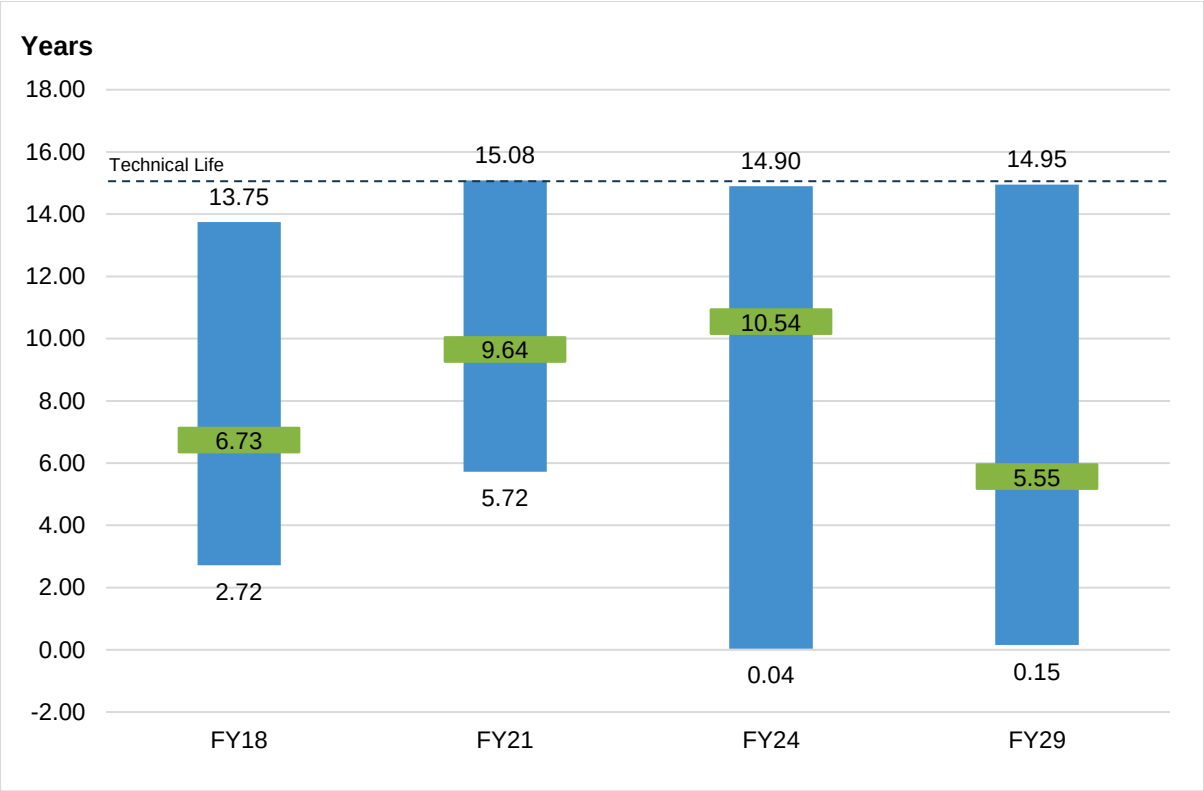


Figure 2 – EWPs – Historic & Projected Maximum, Minimum and Average Ages



As the EWP fleet has aged, it has also been subject to a significant increase in breakdowns. This has been particularly apparent over the last four years where the number of breakdowns per annum has increased by 127% (see **Figure 3** below). These failures have a direct impact on network maintenance and capital delivery, with each incident representative of a significant indirect cost.

Figure 3 – EWP breakdown trend: FY2019 to FY2022

Due to its age, Ausgrid's current EWP fleet comprises basic assets with minimal features, allowing very little flexibility or agility for field crews. Significantly, new platforms can provide greater safety, reach and agility for better access to network assets, increased productivity and higher utilisation.

A smaller EWP with extended reach capability and a reduced footprint is required by field teams operating in urban areas, while regional and rural crews require medium and large assets to provide flexibility of access to a variety of network assets.

New EWPs can provide increased productivity due to greater agility within more modern boom designs. This provides greater reach and maneouvrability when working aloft, giving the operator more options for setup and reducing the need to pack up the entire EWP, move the truck, and resume aloft. An improved stabiliser system allows faster setup and pack up, reducing time spent on these tasks by an estimated 30%.

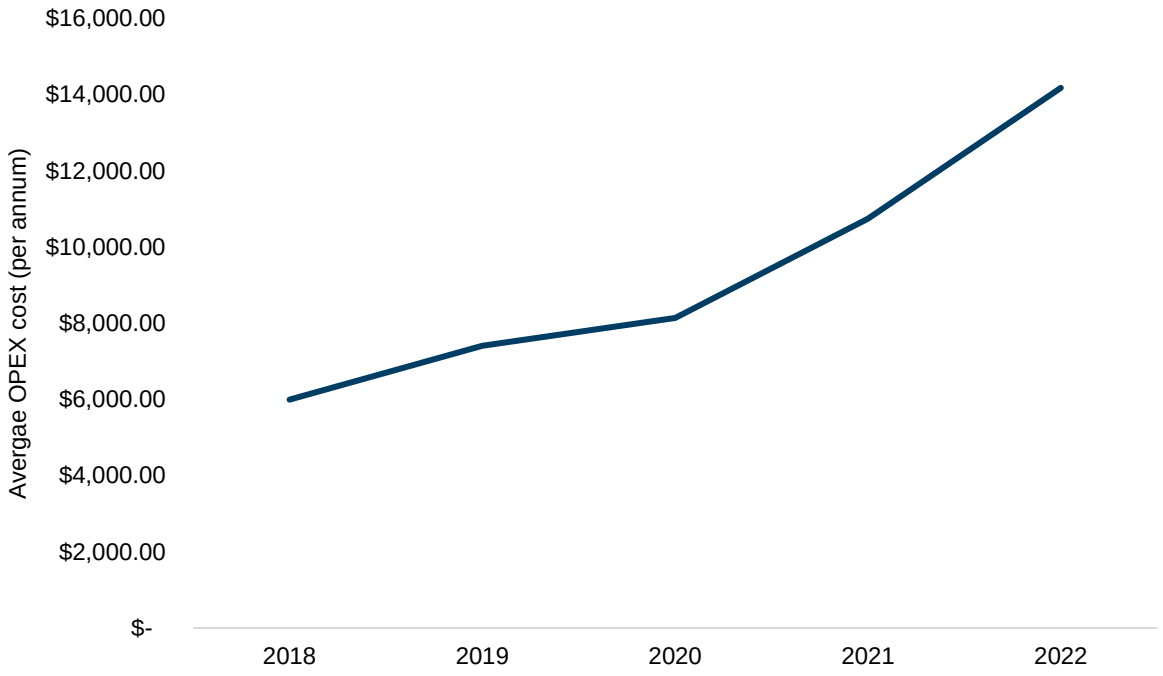
Figure 4 below shows example EWPs manufactured by Ausgrid's newly contracted supplier, Nifty-Lift.

Figure 4 – Demonstration of Nifty-Lift EWPs at Ausgrid's Homebush Depot.

Smaller platforms also have advantages for urban regions in particular with current platforms either protruding into or taking up the entirety of a traffic lane, making traffic control necessary. This increases costs for traffic management contractors, administration of road occupancy licenses. These costs, coupled with the inevitable reduced reliability and increased operating costs (maintenance, repair, fuel, registration, insurance, etc) of an aging fleet (see **Figure 5** below) mean that the introduction of smaller, more modern assets have the potential to result in a significant reduction in both direct and indirect operating costs.

Conversely, failure to replace EWPs at 15 years as intended would result in a requirement to conduct an additional major inspection on each asset, as prescribed in relevant Australian Standards AS 1418 and AS 2550. This would certify the EWP for 5 years at a capital cost equivalent to more than 30% of each asset's replacement cost without materially improving reliability or operating cost. Adopting such a strategy would forego the productivity benefits to be derived from new assets, while also exposing Ausgrid to increased employee and public safety risk.

Figure 5 – EWPs: average operating cost per annum over time



3.3. Compliance requirements

Ausgrid's Fleet Replacement Guidelines stipulate that the technical life for EWP assets is 15 years. This compares favourably when compared to other Distribution Network Service Providers (**DSNP**s), and contractors who generally maintain their fleets to a shorter technical life as shown in **Figure 6** below.

Figure 6 – Fleet lifecycle benchmarking

Company	Passenger Vehicles	**Light Commercial Vehicles**	**Heavy Commercial Vehicles & Plant**
Essential Energy	60 months / 150,000 km	60 months / 150,000 km	10-15 years
Powerlink	48 months	48 – 84 months	8-10 years
Ergon	48 months / 100,000 km	150,000 km	10-15 years
Energex	3 or 5 years	60 months	10-15 years
SA Power Networks	60 months / 150,000 km	60 months / 150,000 km	10 years (EWP) 15 years (crane)
Powercor	60 months / 150,000 km	60 months / 150,000 km	10-15 years (EWP) 10 years (HCV)
Downer	36 months / 90,000 km	36 months / 90,000 km	7-10 years
Jemena	60 months / 150,000 km	60 months / 150,000 km	10-15 years (EWP)

			10 years (HCV)
Ausgrid	**60 months / 150,000 km**	**84 months / 150,000 km**	**15 years**

Source: sgfleet (included in Jemena – Attachment 05-01 – Forecast capital expenditure report – 31 January 2020, p. 114)

EWP assets have regulated maintenance requirements that are prescribed in relevant Australian Standards AS 1418 and AS 2550. They are manufactured to perform for a 10 year life, at which point they must undergo a "major inspection" otherwise known as a rebuild. This process requires the plant to be stripped down completely and inspected, with worn components refurbished or replaced as needed. This certifies the plant for a further 5 years, at the completion of which it must be either rebuilt again or replaced.

Ausgrid has completed an extensive rebuild program for EWP, crane borer and vehicle loading crane (**VLC**) assets over the last 5 years, rebuilding 171 individual assets at a cost of $17 million. Based on current projections, a further 118 major plant assets require rebuild between FY22 and FY25, after which the introduction of replacement assets will mean that no further rebuilds are required until FY29.

3.4. Procurement Strategy

To support the EWP replacement program, Ausgrid recently completed a procurement exercise to establish contracts with market-tested rates for the supply of small, medium, and large/transmission platforms with local suppliers. This procurement was completed in early 2022 with contracts executed with Nifty-Lift and GMJ respectively in September 2022.

4. NPV Methodology & Approach

4.1. Overview of Cash & Probablistic Benefits

The NPV modelling conducted for the 2024-29 Fleet Capital Expenditure Program for EWPs considers the following cash and probabilistic benefits:

- Maintenance costs;
- Repair and breakdown costs;
- Fuel costs;
- Disposal proceeds;
- Safety;
- Reliability; and
- Productivity.

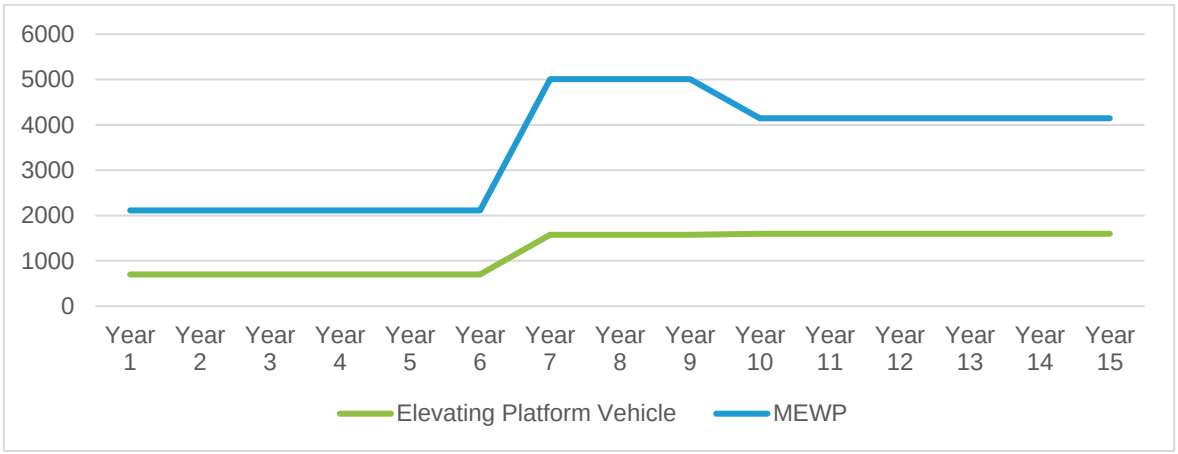
4.2. Maintenance costs

Maintenance costs for EWP assets consider both the elevating platform vehicle and the mobile elevated work platform (**MEWP**) itself. Financial data sourced from the Plant Maintenance module (**PM**) of Ausgrid's Enterprise Resource Platform (**ERP**) has been used to calculate the average maintenance cost by asset age in both these asset classes and exhibits a significant increase in expenditure at Year 7 as shown in **Figure 7** and **Figure 8** below. Notably, maintenance costs for the elevated work platform itself decrease slightly from Year 10 in line with the completion of major inspections / rebuilds.

Figure 7 – Average annual maintenance costs by asset age ($)

Asset Class	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Elevating Platform Vehicle	700	700	700	700	700	700	1,575	1,575	1,575	1,597	1,597	1,597	1,597	1,597	1,597
MEWP	2,112	2,112	2,112	2,112	2,112	2,112	5,008	5,008	5,008	4,145	4,145	4,145	4,145	4,145	4,145

Figure 8 – Average annual maintenance costs by asset age ($)



At time of writing, Ausgrid's youngest EWP asset is 6 years old. In recognition of this fact and the consequent unavailability of maintenance data for new and/or younger assets, the average maintenance cost of Ausgrid's 10 best performing EWP assets has been used to proxy maintenance costs for Year 1 through to Year 6.

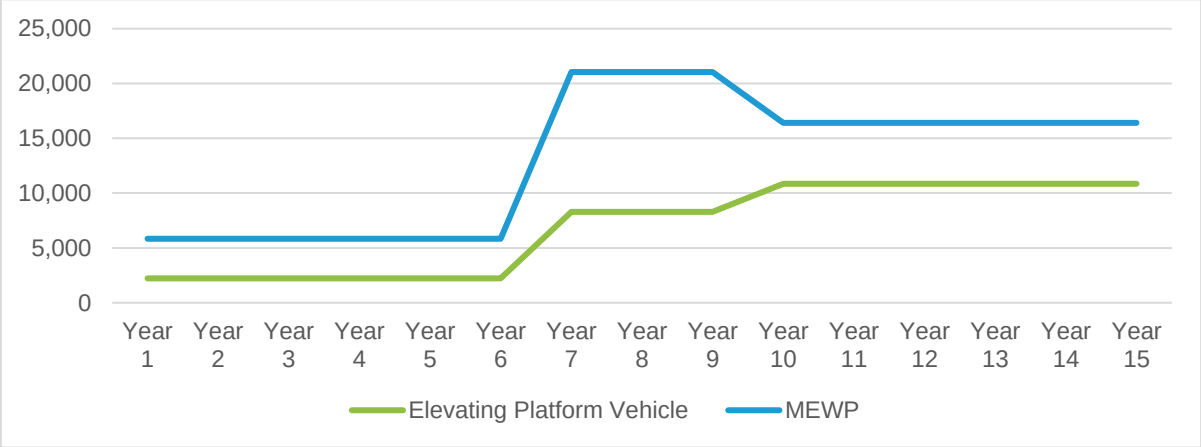
4.3. Repair and breakdown costs

Repair and breakdown costs for EWP assets also consider both the elevating platform vehicle and the mobile elevated work platform itself. Data from PM has been used to calculate the average repair cost by asset age in both these asset classes and again exhibits a significant increase in expenditure at Year 7 as shown in **Figure 9** and **Figure 10** below. As for maintenance costs, repair and breakdown costs for the elevated work platform itself decrease slightly from Year 10 in line with the completion of major inspections / rebuilds.

Figure 9 – Average annual repair costs by asset age ($)

Asset Class	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Elevating Platform Vehicle	2,223	2,223	2,223	2,223	2,223	2,223	8,302	8,302	8,302	10,851	10,851	10,851	10,851	10,851	10,851
MEWP	5,837	5,837	5,837	5,837	5,837	5,837	21,046	21,046	21,046	16,396	16,396	16,396	16,396	16,396	16,396

Figure 10 – Average annual repair costs by asset age ($)



Again, the average repair and breakdown cost for Ausgrid's 10 best performing EWP assets has been used to proxy the likely cost of newer assets between Year 1 and Year 6.

4.4. Fuel costs

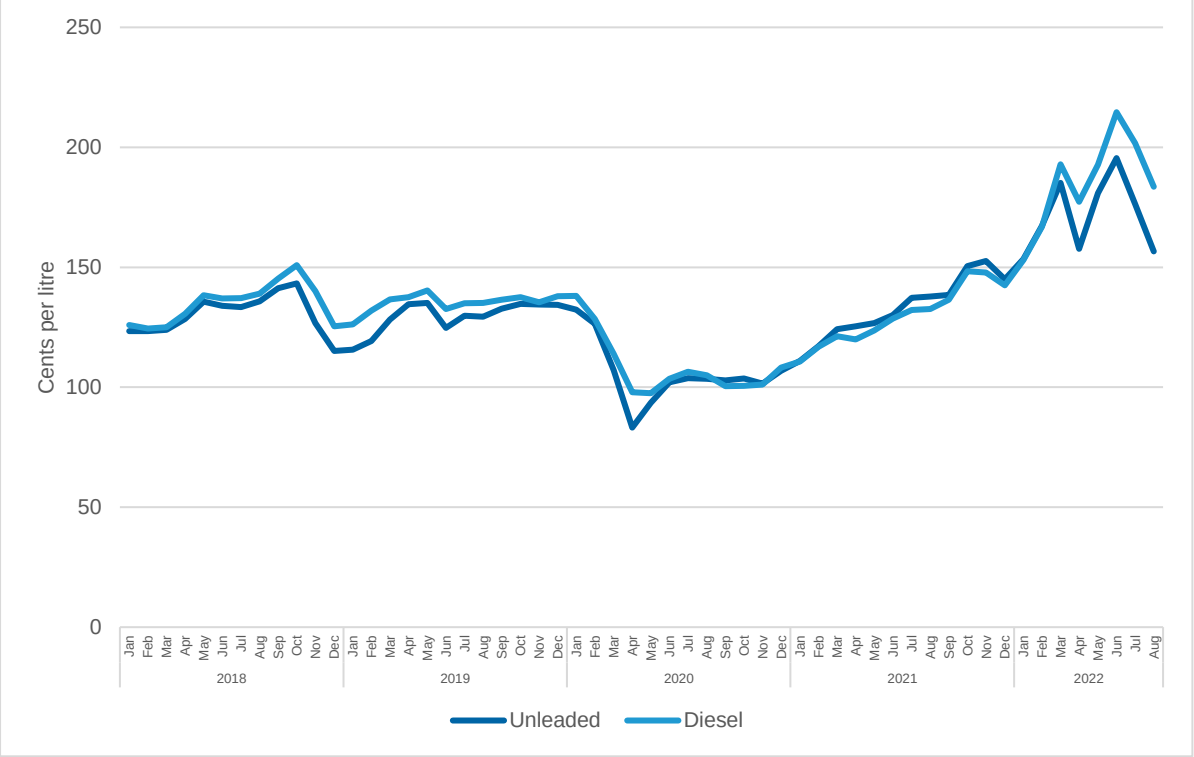
Fuel costs for EWP assets consider only the elevating platform vehicle. Data from Ausgrid's fuel account (see **Figure 11** below) has been used to calculate the average fuel consumption by asset age, with fuel costs calculated based on the estimated distance vehicles in this asset class will travel per annum.

In FY22, Ausgrid EWPs travelled an average distance of 7,961 kilometres per asset however in consideration of the proposed increase in capital expenditure for the 2024-29 period, an annual escalation factor of 2% has been applied and will take projected average travel to 9,145 kilometres per asset by FY29. A diesel price of $1.90 per litre has been used by default within the modelling conducted, however in light of the impact of conflict between Russia and the Ukraine, not to mention a well-established trend of increasing diesel costs as shown in **Figure 12**, a 5% per annum escalation factor has been applied. This will take the forecast diesel price to $2.70 by FY29.

Figure 11 – Annual fuel consumption by asset age (L/km)

Asset Class	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Elevating Platform Vehicle	0.18	0.18	0.18	0.18	0.18	0.18	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49

Figure 12 – Average monthly fuel cost trend – January 2018 to August 2022



Source: Australian Institute of Petroleum – Historical ULP and Diesel Terminal Gate Price Data

4.5. Disposal proceeds

Disposal proceeds for EWP assets consider current sale methods, which combine both the elevating platform vehicle and the mobile elevated work platform. Proceeds vary greatly depending on asset condition, elevating platform vehicle make and the size of the elevated work platform, however for the purposes of modelling an average per asset proceed of $46,000 has been used. This figure is a conservative estimate that has been calculated using a small number of historic sales for this asset class which occurred between FY21 and FY22.

4.6. Safety

Safety is the first probabilistic benefit considered for EWP assets, anticipating a significant decrease in worker twist/strain injuries as a result of the greater reach and agility of the boom and bucket on newer platforms. The benefit calculated considers the total cost of workers compensation claims where the causal injury occurred within an EWP bucket and applies a conservative 10% per annum reduction in claims. The findings of this analysis are summarised in **Figure 11** below.

Figure 11 – EWP-related workers compensation claims summary

EWP-related Workers Compensation Claims – FY2016-2021	
Total cost of claims	**$323,654.11**
Number of claims	**28**
Average claim cost	**$11,559.08**

4.7. Reliability

EWP reliability contemplates the indirect cost of an asset breakdown, that is the impact to Ausgrid's maintenance and/or capital delivery as a result of unplanned asset failure. To assess this impact and its consequent cost, a workshop was held with representatives from Field Operations and Network Delivery Services. This workshop concluded that it was rare for a job to be cancelled as a result of an EWP breakdown, however there was instead a significant increase in the time spent to complete the impacted job – particularly when efforts to reschedule resources and outages were considered.

A summary of the increase in time spent per resource category when a breakdown occurs is summarised in **Figure 12** below.

Figure 12 – EWP breakdowns: time escalator per resource category

Resource category	Time escalator
Lineworker	25%
Technician	25%
Operator	75%
ESO / Plant Operator	25%
Other (Safety Trained)	25%
Works Preparer	10%

To calculate the cost impact of an EWP breakdown, these time (and therefore cost) escalations were applied to the per job cost of common EWP-related tasks from Ausgrid's Field Services Standard Jobs Manual. On this basis, the average breakdown cost was determined to be $901.57 with the per annum impact calculated based on the average number of breakdowns per annum as shown in **Figure 13** below.

Figure 13 – Average number of breakdowns per annum

Asset Class	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
MEWP	1	1	1	1	1	1	3	3	3	3	3	3	3	3	3

4.8. Productivity

EWP productivity contemplates the anticipated increase in productivity to be delivered by greater agility and modern boom designs. New platforms will provide greater reach and maneouvrability when working aloft, giving the operator more options for setup and reducing the need to pack up the entire EWP, move the truck, and resume aloft. An improved stabiliser system will also allow faster setup and pack up.

The probabilistic benefit for productivity has again been calculated using Ausgrid's Field Services Standard Jobs Manual, with specific identification of those jobs which most commonly utilise EWP assets as shown in **Figure 14** below.

Figure 14 – Field Services Standard Jobs Manual: EWP jobs

Job ID	Job Type
SJ135	SL Span Removal
SJ176	SL Head Replace
SJ177	SL Install / Replacement
SJ262	EDO Fuses Carriers Replacement
SJ260	PT Retrofits – including EDO Fuses Carriers
SJ266	Replace Single Pole PT Subs – Three Phase Transformer
SJ166	Pole Replacement – Multiple Visits – LV & HV Combined
SJ178	Planned Service Wire Replacement
SJ160	Crossarm Replacement – De-energised (LVm 11kV and 33kV)

Individual job costs have then been multiplied by anticipated volumes for the 2024-29 period to calculate a total per annum job cost, against which a conservative 5% productivity benefit has been applied.

5. OPTIONS

Four options have been developed, including the Base (Counterfactual) Case which assumes incremental capital expenditure for required major inspections only. These options have been informed by Ausgrid's experience in operating EWPs over the last three regulatory periods (2019-24, 2014-19, 2009-14), and includes consideration of operator feedback, technology advances, fleet utilisation, employee productivity, and employee and public safety.

The expenditure forecast for the Base (Counterfactual) Case, which assumes major inspections (as prescribed in relevant Australian Standards) are undertaken instead of asset replacement, is summarised in **Figure 12**. This approach is not considered acceptable due to the capital expenditure required and the immaterial benefit it would have on reliability and operating costs. Adopting such a strategy would forego the productivity benefits to be derived from new assets, while also exposing Ausgrid to increased employee and public safety risk.

For the purposes of NPV modelling and in recognition of the fact that Ausgrid does not possess operating cost data for EWP assets older than 15 years, it has been assumed that maintenance, repair, fuel, safety and reliability costs would remain constant with neither a benefit nor disbenefit received.

Figure 15 – Expenditure Forecast: Option 1 - Base (Counterfactual) Case

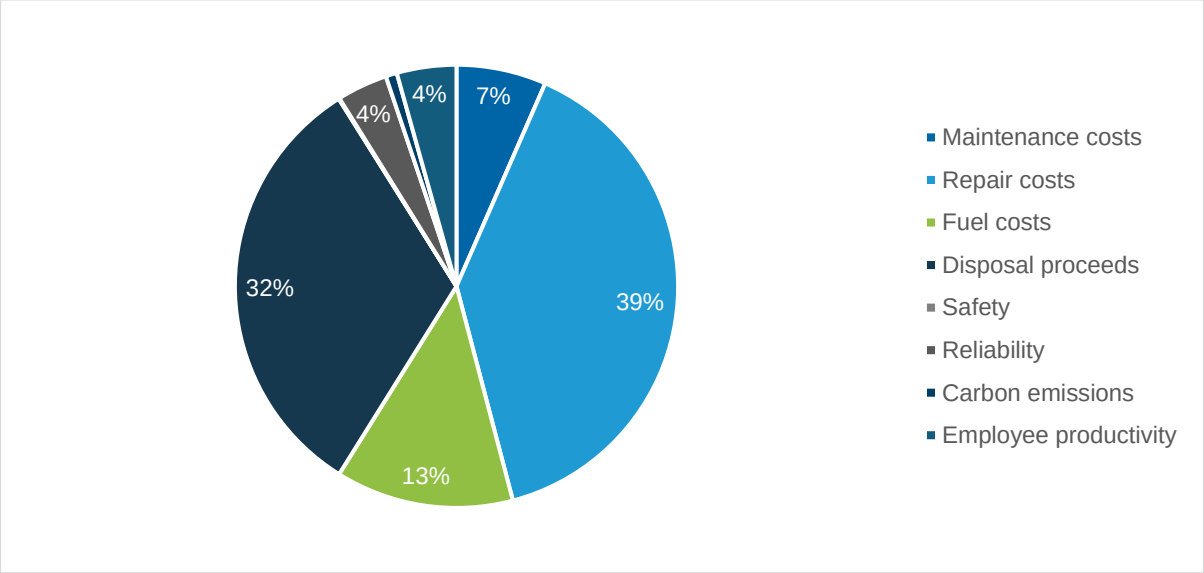
($M Real, FY24)	FY25	FY26	FY27	FY28	FY29	Total
CAPEX	2.9	2.9	2.9	2.9	2.9	**14.3**
OPEX benefits	-	-	-	-	-	**-**
CAPEX benefits	**-**	**-**	**-**	**-**	**-**	**-**

Option 2 assumes current asset volumes are maintained for EWPs. With the majority of EWP assets having recently undergone major inspection / rebuild, this option also assumes that the determined useful life for EWPs is maintained at 15 years. The expenditure forecast and benefit breakdown for Option 2 is summarised in **Figure 16** and **Figure 17** below.

Figure 16 – Expenditure Forecast: Option 2 – BAU Replacement Case

($M Real, FY24)	FY25	FY26	FY27	FY28	FY29	Total
CAPEX	12.4	12.4	12.5	12.7	12.4	**62.5**
OPEX benefits	0.7	1.4	2.2	2.9	3.7	**10.8**
CAPEX benefits	1.1	1.2	1.3	1.4	1.3	**6.3**

Figure 17 – Benefit Breakdown: Option 2 – BAU Replacement Case

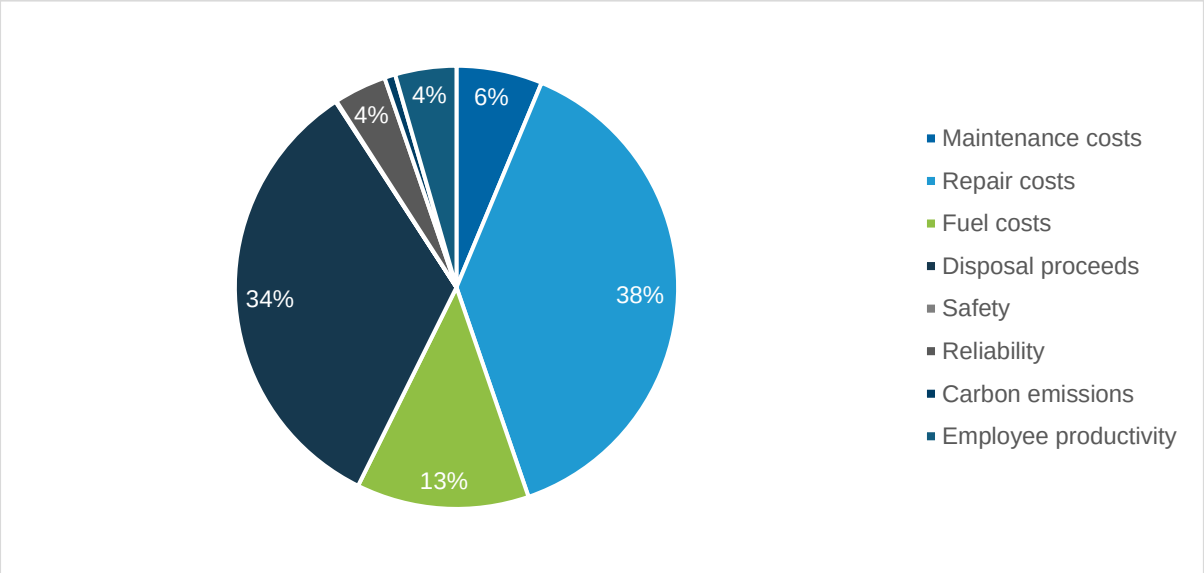


Option 3 assumes a 5% increase in EWP volumes. This parallels a proposed increase of 14% in network capital expenditure between 2019-2024 and 2024-29. This option is further justified by the recent unavailability of EWP assets, noting that much of this reduced availability has been due to Ausgrid's significant program of major inspections / rebuilds (as discussed in section 3.3). The expenditure forecast and benefit breakdown for Option 3 is summarised in **Figure 18** below.

Figure 18 – Expenditure Forecast: Option 3 – Rapid Replacement Case

($M Real, FY24)	FY25	FY26	FY27	FY28	FY29	Total
CAPEX	13.0	13.0	13.1	13.3	13.0	**65.3**
OPEX benefits	0.7	1.4	2.1	2.8	3.6	**10.6**
CAPEX benefits	1.2	1.2	1.3	1.4	1.4	**6.6**

Figure 18 – Benefit Breakdown: Option 3 – Rapid Replacement Case

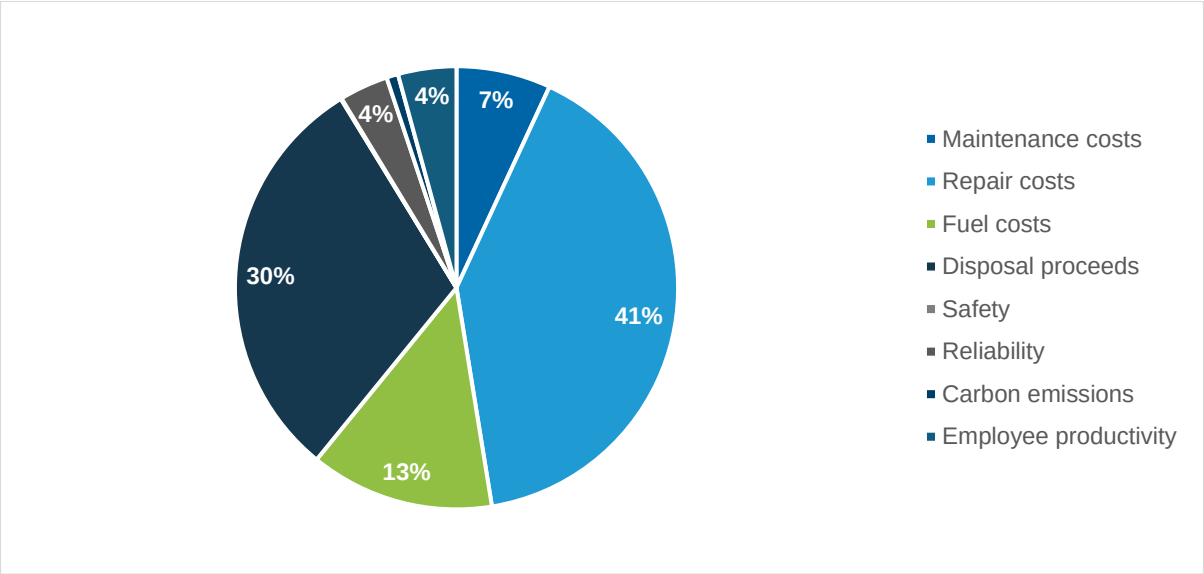


Option 4 assumes a 5% reduction in EWP replacement volumes, implying that further fleet optimisation is possible and should continue. Recent experience with the reduced availability of EWP assets, coupled with the proposed increase in network capital expenditure for the 2024-29 period would suggest that this option would expose Ausgrid to significant risk of under-delivery. The expenditure forecast and benefit breakdown for Option 4 is summarised in **Figure 19** and **Figure 20** below.

Figure 19 – Expenditure Forecast: Option 4 – Further Optimisation Case

($M Real, FY24)	FY25	FY26	FY27	FY28	FY29	Total
CAPEX	12.4	12.4	12.5	11.6	10.7	**59.6**
OPEX benefits	0.8	1.5	2.3	3.0	3.7	**11.3**
CAPEX benefits	1.1	1.2	1.3	1.3	1.2	**6.1**

Figure 20 – Benefit Breakdown: Option 3 – Further Optimisation Case



6. RECOMMENDATION

Options for Ausgrid's EWP replacement program that have been considered for this business case, including the Market NPV outcomes, are summarised in **Figure 21**.

Figure 21 – EWP: NPV Modelling Options

Option	Description	Market NPV
Option 1: **BASE CASE (Counterfactual)**	Key initiatives include: • **Incremental investment for major inspections only**	**-$13.4 million**
Option 2: **BAU REPLACEMENT**	Key initiatives include: • **Current asset volumes maintained** • **No change to determined useful life of: 15 years**	**$30.7 million**
Option 3: **RAPID REPLACEMENT**	Key initiatives include: • **Asset replacement volumes increased by 5% per annum** • **No change to determined useful life of: 15 years**	**$26.7 million**
Option 4: **FURTHER OPTIMISATION**	Key initiatives include: • **Asset replacement volumes reduced by 5% per annum** • **No change to determined useful life of: 15 years**	**$34.7 million**

The recommended option for the 2024-29 period is Option 2. For a capital cost of $62.5 million, it results in an NPV of $30.7 million. While quantitative analysis demonstrates that Option 4 will unlock the greater net economic benefits compared to this option, the risk that a shortage of EWP assets would expose Ausgrid's network capital delivery to is not considered acceptable.

6.1.1. Alignment to strategy

In line with Ausgrid's ELT-endorsed Fleet Strategy, preparations for the 2024-29 Fleet Capital Expenditure Program has already commenced. Selection of new assets has been finalised and delivered a significant reduction in the number of models across the EWP fleet in order to reduce maintenance and repair costs.

Future EWP platforms will address the needs of the business by:

- Introducing technology improvements;
- Providing increased agility and manoeuvrability for field work;
- Reducing the footprint of the assets; and
- Improving off-road access capability.

6.1.2. Program delivery risks and dependencies

The most significant risk to delivery of the 2024-29 Fleet Capital Expenditure Program EWPs relates to the direct and indirect impacts of the COVID-19 pandemic on Ausgrid's contracted supplier, as well as market capacity constraints.

The Fleet Engineering & Strategy team and its current level of resourcing is a critical dependency to the successful delivery of this program. This includes the third-party support of an FMO (currently *sgfleet*) who will be relied upon to administer ordering processes. Successful delivery of the EWP program is also dependent on robust, on-site pre-commissioning inspections and the development of risk assessments and safe operating procedures.

It is considered that these risks have been appropriately mitigated through robust planning, the establishment of key commercial arrangements, and the on-boarding of additional dedicated resourcing within the Fleet Engineering & Strategy team.

6.1.3. Business area impacts

#	Impacted Group	Description
01	Field Operations	Staff within this workgroup account for the majority of EWP allocations, with approximately 90% of the fleet assigned.
02	Network Delivery Services	Staff within this workgroup account for the remaining 10% of EWP allocations.

6.1.4. Next steps

This business case has been developed to support Ausgrid's proposed fleet capital expenditure (capex) forecast and should be read in conjunction with Ausgrid's Fleet Strategy. Subject to endorsement by the Investment Governance Committee, it will be used for Ausgrid's FY25-29 Regulatory Proposal.