12115 Telecommunications Unit Asset Replacement

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Project description

ElectraNet's transmission network is one of the most extensive regional transmission systems in Australia, extending across some 200,000 square kilometres of the State. Overlaying the transmission network is a Telecommunications Network, required to carry protection, SCADA, telephony and various other operational and business data.

The Telecommunication Asset Management Plan identified assets whose performance and maintainability is degrading to an extent that it increases the risk to the operability and stability of the transmission network.

In accordance with ElectraNet's Asset Management Plan, telecommunications assets were rated using the SCAR coding framework to determine the asset risk profile. This project is required to replace those assets that fall under the high risk category.

This project is required to be undertaken in the period 2019-2023.

Project options

Base case
Units are run to failure with emergency replacement of telcommunications asset as required.

Option 1 Install Telecommunications Assets in 2019-2023
A planned replacement program is undertaken in 2019-2023.

Option 2 Undertake option 1 in next regulatory period
The planned replacement program is delayed by five years to 2024-2028. This option includes emergency replacement for the first five years and a reduction in the assets required to be replaced under the planned replacement program.

Key modelling assumptions

Financial year runs from 1 July to 30 June.

Real 2018 $ are used for all monetary values unless otherwise stated.

Inputs to the model

Parameter/Input	Description	Source
Discount rate	Real pre-tax discount rate	ElectraNet estimate
Current financial year	Year to start analysis	When the capital investment is due to occur for the project
Time horizon	Length of time under consideration	Total project life including useful life and if the project occurred in the next regulatory period
Capital costs	Amount of capital investment in real terms for each project option	Detailed Costs Assessment and Telecommunication Asset management plan
Useful life	Length of time capital investments are expected to provide service	Useful life estimated from orginal economic justification on project center
Emergency Response to failure	Annual cost of responding to unit asset failure assuming 5% will fail	Detailed Cost Assessment

I0 Inputs
User provided parameters and inputs to the model

Inputs

General parameter inputs

Parameter	Unit	Value	Source
Inflation rate	Percentage	2.00%	RBA
Discount rate (real, pre-tax): estimate	Percentage	6.00%	ElectraNet estimate
Discount rate (real, pre-tax): lower bound	Percentage	4.50%	ElectraNet estimate
First year of analysis	Year	2019	Current financial year
Base financial year for analysis	Year	2018	Base year
Time horizon	Years	20	ElectraNet

	Sensitivities	
Low	Medium	High
1.50%	2.00%	3.00%
4.50%	6.00%	8.50%

Capital cost

Sensitivities			Comment
Low	Medium	High	
70%	100%	130%	Standard sensitivities used

Capital cost inputs

Option	Asset	Amount	Start year	End year	Commission year	Asset life
Base Case	Reactive replacement of Radios and Bearers	301,276	2019	2019	2020	10
Base Case	Reactive replacement of Radios and Bearers	1,045,303	2020	2020	2021	10
Base Case	Reactive replacement of Radios and Bearers	2,580,053	2021	2021	2022	10
Base Case	Reactive replacement of Radios and Bearers	2,443,553	2022	2022	2023	10
Base Case	Reactive replacement of Radios and Bearers	936,803	2023	2023	2024	10
Base Case	Reactive replacement of Radios and Bearers	256,053	2024	2024	2025	10
Base Case	Reactive replacement of Radios and Bearers	256,053	2025	2025	2026	10
Base Case	Reactive replacement of Radios and Bearers	256,053	2026	2026	2027	10
Base Case	Reactive replacement of Radios and Bearers	256,053	2027	2027	2028	10
Base Case	Reactive replacement of Radios and Bearers	256,053	2028	2028	2029	10
Option 1	Radios and Bearer	563,460	2019	2019	2020	10
Option 1	Radios and Bearer	1,209,413	2020	2020	2021	10
Option 1	Radios and Bearer	1,929,614	2021	2021	2022	10
Option 1	Radios and Bearer	1,935,716	2022	2022	2023	10
Option 1	Radios and Bearer	1,178,915	2023	2023	2024	10
Option 2	Reactive replacement of Radios and Bearers	301,276	2019	2019	2020	10
Option 2	Reactive replacement of Radios and Bearers	1,045,303	2020	2020	2021	10
Option 2	Reactive replacement of Radios and Bearers	2,580,053	2021	2021	2022	10
Option 2	Reactive replacement of Radios and Bearers	2,443,553	2022	2022	2023	10
Option 2	Reactive replacement of Radios and Bearers	936,803	2023	2023	2024	10
Option 2	Radios and Bearer	350,000	2024	2024	2025	10
Option 2	Radios and Bearer	210,000	2025	2025	2026	10
Option 2	Radios and Bearer	70,000	2026	2026	2027	10
Option 2	Radios and Bearer	70,000	2027	2027	2028	10

Costs inputs

Cost type	Cash/Non-cash	Percentage			Comment
		Low	Medium	High	
Emergency response to failure	Cash	70%	100%	130%	Standard sensitivities used

Financial year		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Comment
Emergency response to failure	Units	$	$	$	$	$	$	$	$	$	$	
Base case	2018 $	25,200	45,400	45,400	45,400	45,400	45,400	45,400	45,400	45,400	45,400	Emergency replacement costs in the base case are
Option 1	2018 $	25,200	0	0	0	0	0	0	0	0	0	only for 10 years becasuse this is how long all of the
Option 2	2018 $	25,200	45,400	45,400	45,400	45,400	0	0	0	0	0	assets take to be reactively replaced.

R0 CBA Results
Sensitivities, results and rankings

Input Summary

Parameter selection for sensitivity analysis				Discount rate

Scenario parameters			Discount rate scenario	
	Units	Low	Medium	High
Assumed scenario weighting	% weighting	33%	33%	33%
Discount rate	% real, pre-tax	4.50%	6.00%	8.50%
Capital cost	% of estimate	100%	100%	100%

Cost selection for sensitivity analysis			Emergency response to failure	

Scenario cost inputs		Emergency response to failure scenario		
	Units	Low	Medium	High
Emergency response to failure	% of estimate	70.0%	100.0%	130.0%

Cost Benefit Analysis Results (Quantitative)

Output summary	Net present value of benefits				

NPV results			Scenario		Weighted
Option	Units	Low	Medium	High	NPV
Option 1	2018 $	1,523,434	1,471,354	1,337,505	1,444,098
Option 2	2018 $	494,556	477,140	422,509	464,735

Output summary	Ranking of options				

Ranking of options			Scenario		Weighted
Option	Units	Low	Medium	High	ranking
Option 1	2018 $	1	1	1	1
Option 2	2018 $	2	2	2	2