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Project description

It has been identified that communication traffic across sections of the Brinkworth – Robertstown line is facing capacity constraints across the radio links between Brinkworth – Bungaree Hill, Bungaree Hill – Clare North, Clare North – Quarry Hill and Quarry Hill – Waterloo East.

In addition, the substation of Mintaro is currently serviced by a radio site at Mt Horrocks (and two radio links, Mintaro – Mt Horrocks and Mt Horrocks – Quarry Hill). Replacing the six existing radios with high capacity radio will provide more adequate communications capacity to serve the needs of this region of the network.

This project is required to meet the Rules capital expenditures objective to comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services and to maintain the quality, reliability and security of supply of prescribed transmission services.

Project options

Base case	Only reactive capital expenditure with business as usual costs escalating to maintain aging assets and account for escalating risk
Option 1	Install OPGW on the link from Brinkworth to Waterloo (via Mintaro and Clare North).
Option 2	Install buried fibre between Brinkworth and Waterloo via Clare Nth and Mintaro, decommission 6 radio links, vacate the leased site of Mt Horrocks and exit Quarry Hill.

Option 3

Delay the planned replacement for installing the OPGW until 2029-2034 as prior to this units are run to failure with emergency replacement of telecommunications asset as required

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
Inflation rate	Rate of inflation.	Reserve Bank of Australia
Discount rate	Real pre-tax discount rate.	ElectraNet estimate
First year of analysis	Year to start analysis.	ElectraNet
Base financial year for analysis	Base year of dollar used in inputs tab.	ElectraNet
Time horizon	Length of time under consideration.	ElectraNet
Capital costs	Amount of capital investment in real terms for each project option.	ElectraNet project budgets and estimates
Useful life	Length of time capital investments are expected to provide service.	ElectraNet project budgets and estimates
Routine maintenance	Annual amount of estimated routine maintenance in real terms	Detailed Opex Assessment
Line Unreliabilty	Annual line unreliabilty due to of a lack of shielding	Line unreliability Tab
Line Maintenance	Annual line maintenance cost	Detailed Opex Assessment

## 10 Inputs

User provided parameters and inputs to the model

## Inputs

### General parameter inputs

Parameter	Unit	Value	Source	Sensitivities		
				Low	Medium	High
Inflation rate	Percentage	2.00%	RBA	1.50%	2.00%	3.00%
Discount rate (real, pre-tax): estimate	Percentage	6.00%	ElectraNet estimate	4.50%	6.00%	8.50%
Discount rate (real, pre-tax): lower bound	Percentage	4.50%	AER determination			
First year of analysis	Year	2019	Current financial year			
Base financial year for analysis	Year	2018	Base year			
Time horizon	Years	20	ElectraNet			

## Capital cost

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

Capital cost inputs					Commission	
Option	Asset	Amount	Start year	End year	Year	Asset life
Base case	Reactive radio link repl	4,008,000	2020	2022	2023	10
Base case	Reactive radio link repl	4,008,000	2030	2032	2033	10
Option 1	OPGW	2,548,000	2020	2022	2023	55
Option 1	OPGW	8,575,795	2020	2022	2023	55
Option 2	Buried fibre component	7,000,000	2020	2022	2023	30
Option 2	Line component	2,548,000	2020	2022	2023	55
Option 3	Line component	2,548,000	2020	2022	2023	55
Option 3	Reactive radio link repl	4,111,200	2020	2022	2023	10
Base case	Line component	2,548,000	2020	2022	2023	55
Option 3	OPGW	8,342,846	2030	2032	2033	55

## Costs inputs

Cost type	Cash/Non-cash	Percentage			Comment
		Low	Medium	High	
Routine Maintenance	Cash	70%	100%	130%	Standard sensitivities used
Line Unreliability	Cash	70%	100%	130%	Standard sensitivities used
Line Maintenance	Cash	70%	100%	130%	Standard sensitivities used

Financial year		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038 Comment
Routine Maintenance	Units	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Base case	2018 \$	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000 Cost of OPEX for Radio, Buried Fibre and of
Option 1	2018 \$	139,000	139,000	139,000	139,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000 emergency corrective replacement as detailed on the
Option 2	2018 \$	139,000	139,000	139,000	139,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000 Opex Assessment
Option 3	2018 \$	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	5,000	5,000	5,000	5,000	5,000	5,000

Financial year		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Comment
Line Unreliability	Units	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Base case	2018 \$	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	Note this does not take into account VCR of outages
Option 1	2018 \$	54,367	54,367	54,367	54,367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 that require replacement of insulator string
Option 2	2018 \$	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	
Option 3	2018 \$	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	54,367	0	0	0	0	0	0

[illegible]

R0 CBA Results

Sensitivities, results and rankings

Input Summary

Parameter selection for sensitivity analysisDiscount 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 analysisRoutine Maintenance

Scenario cost inputs		Routine Maintenance scenario		
	Units	Low	Medium	High
Routine Maintenance	% of estimate	70.0%	100.0%	130.0%
Line Unreliability	% of estimate	70.0%	100.0%	130.0%
Line Maintenance	% of estimate	100.0%	100.0%	100.0%

Cost Benefit Analysis Results (Quantitative)

Output summaryNet present value of benefits

NPV results		Scenario			Weighted
Option	Units	Low	Medium	High	NPV
Option 1	2018 \$	1,422,517	871,206	39,464	777,729
Option 2	2018 \$	1,048,010	757,451	245,470	683,644
Option 3	2018 \$	294,656	105,216	-126,084	91,263

Output summaryRanking of options

Ranking of options		Scenario			Weighted
Option	Units	Low	Medium	High	ranking
Option 1	2018 \$	1	1	2	1
Option 2	2018 \$	2	2	1	2
Option 3	2018 \$	3	3	3	3