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## Project description

Condition assessment reports identified issues with the selected assets. Significant consequences of failure to personnel and network exist in the event of insulator failure, if it were not replaced. Primarily the consequences relate to network availability and safety, but also include: reputation, environment and financial. This project is required to refurbish insulator systems on selected lines to achieve a life extension of the overall asset. The project is to be completed in the 2018-23 regulatory period. The feeder identified for insulator replacement is F1921 PARA - TUNGKILLO 275kV Line - 95 structures.

## Project options

<b>Base case</b>	Business as usual with no capital expenditure.
<b>Option 1</b>	Replacement in 2018-2023
<b>Option 2</b>	Replacement in 2023-2028

## 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	Estimated capital costs in the estimate from project center
Useful life	Length of time capital investments are expected to provide service	Useful life estimated from original economic justification on project center
Routine maintenance	Annual amount of estimated routine maintenance in real terms	See Detailed Opex Assessment
Corrective maintenance	Annual amount of estimated corrective maintenance in real terms	See Detailed Opex Assessment
Risk	Annual cost of risk if the unit is not replaced	See Detailed Risk Assessment

**IO 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%	ElectraNet estimate			
First year of analysis	Year	2018	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						
Option	Asset	Amount	Start year	End year	Commission year	Asset life
Option 1	Line Insulator	3,930,583	2018	2022	2023	27
Option 2	Line Insulator	3,930,583	2023	2027	2028	27

**Costs inputs**

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

Financial year	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
<b>Routine Maintenance</b>																					
Base case	2018 \$	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267
Option 1	2018 \$	194,267	194,267	194,267	194,267	194,267	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960
Option 2	2018 \$	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	194,267	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960	2,960

**Benefit inputs**

Benefit type	Cash/Non-cash	Percentage			Comment
		Low	Medium	High	
Risk Cost Reduction	Cash	50%	80%	100%	Lower sensitivities

Financial year	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
<b>Risk Cost Reduction</b>																					
Base case	2018 \$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Option 1	2018 \$	0	0	0	0	0	3,277,031	3,383,531	3,494,709	3,610,145	3,729,501	3,852,497	3,978,897	4,108,501	4,241,132	4,376,639	4,514,885	4,655,748	4,799,121	4,944,905	5,093,009
Option 2	2018 \$	0	0	0	0	0	0	0	0	0	0	3,852,497	3,978,897	4,108,501	4,241,132	4,376,639	4,514,885	4,655,748	4,799,121	4,944,905	5,093,009

## R0 CBA Results

Sensitivities, results and rankings

### Input Summary

#### Parameter selection for sensitivity analysis

Capital cost

Scenario parameters		Capital cost scenario		
	Units	Low	Medium	High
Assumed scenario weighting	% weighting	33%	33%	33%
Discount rate	% real, pre-tax	6.00%	6.00%	6.00%
Capital cost	% of estimate	70%	100%	130%

#### Cost selection for sensitivity analysis

Routine Maintenance

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

#### Benefit selection for sensitivity analysis

Risk Cost Reduction

Scenario benefit inputs		Risk Cost Reduction scenario		
	Units	Low	Medium	High
Risk Cost Reduction	% of estimate	50.0%	80.0%	100.0%

### 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 \$	14,356,596	23,145,872	28,859,290	22,120,586
Option 2	2018 \$	8,883,804	14,330,675	17,864,765	13,693,081

#### 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