

Contents

Inputs	Tab I0
Calculations	C0
Cashflow	C1
CBA results	R0
Cashflow results	R1

Cell colour key

Header 1

Header 2

Table Header

Format	Example
Table Row Name	Text
Input Cell	
Calculation cell	
Parameter Cell	
Output Cell	

Project description

A project to replace 101 isolators that have reached the end of their technical and economic lives. The isolators identified for replacement are listed in the Isolators tab. This project considers several options including, running existing units to failure (in practice this means increasing corrective maintenance cost and decreasing reliability) or planned replacements.

Project options

Base case	Business as usual with no capital expenditure.
Option 1	101 isolators have been identified for replacement, aged between 46 and 62 years. The works assumed for this project includes the replacement of these isolators where no other Capital Projects are scheduled to undertake replacement of the identified isolators in the 2019-2023 regulatory period. This replacement is to be completed in accordance with the Substation Design Manual and relevant standards.
Option 2	Replace isolators in the 2024-2028 regulatory period. However, 50 Isolators have already been replaced by emergency replacement therefore only 51 are required to be replaced.

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	Latest estimate v9 20/9/2016, Total Cost \$10,415,360
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	Assume 1% of Capital Cost
Corrective maintenance	Amount of estimated corrective maintenance in real terms	Detailed Opex Assessment
Emergency replacement cost	Cost to replacement units as the units fail	Detailed Opex Assessment
Risk cost reduction	Value of risk associated with each of the different options.	See detailed risk models



ulated
to the
J. Option 1

ulated
to the
J. Option 1



roject has

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 Corrective Maintenance

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

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 \$	2,295,498	2,527,038	2,328,412	2,383,649
Option 2	2018 \$	1,975,717	1,924,187	1,608,033	1,835,979

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

Other Considerations (Qualitative)

As these assets are at the end of their technical life, there is increased risk of failure which could lead to increased safety and reliability issues.

It is likely that if these assets are not replaced that a number will fail during the regulatory period or the next period resulting in corrective operational expenditure cost and the unplanned unavailability of parts of the network.

This project is required to replace individual substation isolators that have been assessed to be at the end of their technical and/or economic lives, at locations where the asset won't be replaced as part of an augmentation or substation rebuild during the 2019-23 regulatory control period.