Introduction   **14085 Gawler East Connection Point**

Contents

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

SA Power Networks is in the process of establishing a new substation at Gawler East to supply a new residential development. SA Power Networks identified a solution which supplies its 11 kV distribution network directly from ElectraNet's 132 kV transmission network between Para and Roseworthy, as a potential alternative to a more expensive 66 kV sub-transmission network solution. RIT-D for this project will be carried out by SA Power Networks.

Project options

Base case	Business as usual with no capital expenditure.
Option 1	Construct a new 132/11kV Connection Point Zone Substation. ElectraNet owns transformer: T-off ElectraNet's Para – Roseworthy 132 kV transmission line and establish an 11 kV connection point. ElectraNet to purchase two 132/11 kV transformers; one to be installed at connection point and another to be kept as a spare.
Option 2	SAPN extends 66 kV network: Construct a new 66/11kV Zone Substation in the Gawler East region with 66kV line extension, new 11kV feeders into the development area and new 11kV feeder ties to the Evanston Zone Substation.
Option 3	Upgrade the existing 33kV line to 508ACSR from Templers to Gawler Belt Tee. Construct approximately 6km of new 33kV line from Gawler Belt Tee and construct a new 33/11kV zone substation in the Gawler East region, new 11kV feeders into the development area and new 11kV feeder ties to the Evanston Zone Substation.

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 centre
Useful life	Length of time capital investments are expected to provide service	Useful life estimated from original economic justification on project centre
Maintenance	Annual amount of estimated maintenance in real terms	See Cals sheet
Unserved Energy	Annual cost of unserved energy	See Cals sheet

I0 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	2019	Current financial year			
Base financial year for analysis	Year	2018	Base year			
Time horizon	Years	20				

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	132/11kV Zone Substation	16,000,000	2019	2022	2023	40
Option 2	66/11kV Zone Substation	19,000,000	2019	2022	2023	40
Option 3	33/11kV Zone Substation	34,000,000	2019	2022	2023	40

Costs inputs

Cost type	Cash/Non-cash	Percentage			Comment
		Low	Medium	High	
Maintence Cost	Cash	70%	100%	130%	Standard sensitivities used
Unserved Energy	Cash	70%	100%	130%	

Financial year		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Maintence Cost	**Units**	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
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	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000
Option 2	2018 $	0	0	0	0	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000
Option 3	2018 $	0	0	0	0	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000

Financial year		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Unserved Energy	**Units**	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Base case	2018 $	0	0	0	0	775,501	1,551,002	2,326,503	3,102,004	3,877,505	4,653,005	5,428,506	6,204,007	6,979,508	7,755,009	8,530,510	9,306,011	10,081,512	10,857,013	11,632,514	12,408,014
Option 1	2018 $	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Option 2	2018 $	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Option 3	2018 $	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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				Routine Maintenance

Scenario cost inputs		Routine Maintenance scenario		
	Units	Low	Medium	High
Maintence Cost	% of estimate	100.0%	100.0%	100.0%
Unserved Energy	% of estimate	100.0%	100.0%	100.0%

Benefit selection for sensitivity analysis				Reduced Constraints

Scenario benefit inputs		Reduced Constraints scenario		
	Units	Low	Medium	High
Benefit 1	% of estimate	80.0%	80.0%	80.0%

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 $	43,443,016	33,040,944	20,482,760	32,322,240
Option 2	2018 $	41,216,117	30,763,218	18,192,540	30,057,292
Option 3	2018 $	30,081,620	19,374,593	6,741,439	18,732,550

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
Option 3	2018 $	3	3	3	3