DEMAND SIDE MANAGEMENT OPTIONS FOR A BUSINESS PRECINCT

evoenergy

Summary

It is assumed that a business precinct will undergo some new development in near future. The electricity demand forecast for this project is approximately 10MVA and that will occur within next 10 years. The annual demand increase is not accurately predicted for next 10 years because this project should undergo feasibility and planning processes to further refine the infrastructure and services requirements including the energy sources and their usage. However ActewAGL has a responsibility to plan its network development to accommodate this type of projects by some augmentations and ensure that this new business precinct assets will be supplied.

Disclaimer: The details such names of organizations, precincts, electricity demand, costs and the timing as used in this example are fictitious.

Augmentation options as shown below include network supply side and demand side options:

Figure 1: Augmentation Options

Enter Option Name Details

Option Name	Option Description
One	Network Option
Two	Customer Tri Gen
Three	Customer Gas Gen
Four	Demand Reduction and Peak demand Shifting
Five	Customer (Tri Gen + Gas Gen) + Demand reduction and Peak Demand Shifting
Six	

The annual demand growth, capacity and timing of each option is shown in Figure 2 below.

Figure 2: Annual demand Growth and Options timing

					Supply side option	Non-Network options			
	Year end	Demand growth	Capacity available (n-1)	Capacity need	Option 1 Two Fdrs	Option 2 - Tri Gen (1MVA)	Option 3 - Gas Gen (2MVA)	Option 4 - DR (2MVA)	Option 5 - Tri + Gas + DR (5MVA)
2014	0	2	1.5	0.5		1	2	2	5
2015	1	4	1.5	2.5	6	7	8	8	5
2016	2	6	1	5	6	7	8	8	5
2017	3	8	0.5	7.5	12	13	8	8	11
2018	4	10	0	10	12	13	14	14	11
2019	5								
	Fdr 1				1st at year 1	1st at year 1	1st at year 1	1st at year 1	1st at year 3
	Fdr 2				2nd at year 3	2nd at year 3	2nd at year 4	2nd at year 4	2nd Fdr not required

NPV analysis is undertaken and shows the NPV values of different options considered and the timing of deferment of network supply side options.

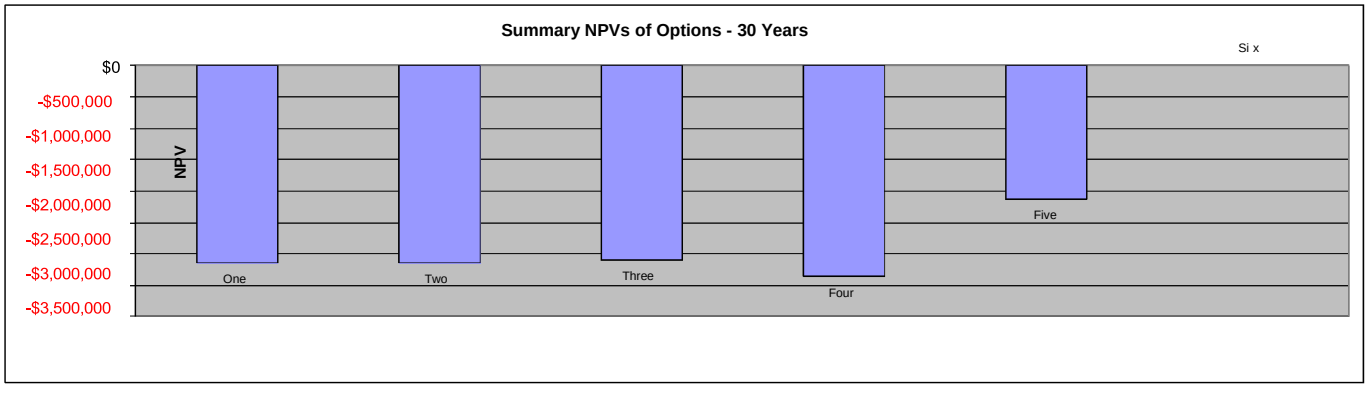
Figure 3: NPV Analysis

Enter Capital Expenditure Cashflows for Each	Year 0	Year 1	Year 2	Year 3	Year 4	2017-18	2018-19
One	Values entered in Year 1 Dollars - excluding GST						
Design Phase	200,000						
Civil Works, Generating Plant, Other Costs	1,750,000		875,000				
ActewAGL Construction Phase Costs	500,000		500,000				
Contingency	250,000	-	250,000				
Other		-	-	-	-		
Total	$2,700,000.0	$0.0	$1,625,000.0	$0.0	$0.0	$0.0	$0.0
Two	Values entered in Year 1 Dollars - excluding GST						
Design Phase	200,000						
Civil Works, Generating Plant, Other Costs	1,750,000		875,000				
ActewAGL Construction Phase Costs	500,000		500,000				
Contingency	250,000		250,000	-	-	-	-
Other	10,000	-	-	-	-	-	-
Total	$2,710,000.0	$0.0	$1,625,000.0	$0.0	$0.0	$0.0	$0.0
Three	Values entered in Year 1 Dollars - excluding GST						
Design Phase	200,000						
Civil Works, Generating Plant, Other Costs	1,750,000			875,000			
ActewAGL Construction Phase Costs	500,000			500,000			
Contingency	250,000			250,000			
Other	20,000		-	-			
Total	$2,720,000.0	$0.0	$0.0	$1,625,000.0	$0.0	$0.0	$0.0
Four	Values entered in Year 1 Dollars - excluding GST						
Design Phase	200,000						
Civil Works, Generating Plant, Other Costs	1,750,000			875,000			
ActewAGL Construction Phase Costs	500,000			500,000			
Contingency	250,000			250,000			
Other	30,000	20,000	20,000	20,000	20,000	20,000	20,000
Total	$2,730,000.0	$20,000.0	$20,000.0	$1,645,000.0	$20,000.0	$20,000.0	$20,000.0
Five	Values entered in Year 1 Dollars - excluding GST						
Design Phase			200,000				
Civil Works, Generating Plant, Other Costs			1,750,000			-	
ActewAGL Construction Phase Costs			500,000			-	
Contingency			250,000			-	
Other	60,000	20,000	20,000	20,000	20,000	20,000	20,000
Total	$60,000.0	$20,000.0	$2,720,000.0	$20,000.0	$20,000.0	$20,000.0	$20,000.0

Figure 3a: NPV Results

RESULTS:	***One***	***Two***	***Three***	***Four***	***Five***
Capital Outlay (Real 2012/13 $)	$4,325,000	$4,335,000	$4,345,000	$5,335,000	$3,740,000
Nominal Capital & Cash Flows - 50 years	$3,085,113	$3,092,113	$3,128,994	$4,573,793	$3,465,502
NPV - 50 years	($3,132,886)	($3,140,386)	($3,096,352)	($3,383,296)	($2,165,375)
NPV - 30 years	($3,132,949)	($3,140,448)	($3,096,424)	($3,351,321)	($2,133,382)
NPV - 20 years	($3,134,094)	($3,141,596)	($3,097,733)	($3,315,955)	($2,097,663)

Figure 3b: Graphical presentation of NPV Results



Conclusion

Option 5 is the most economical of all options. In comparison with Network supply side option (Option 1) the option 5 is better off by $1,000,000. This is the maximum of accrued avoided costs and benefits towards funding of demand management initiatives as considered in this analysis. The option 1 may be differed by 3 years and reduced to a single feeder option by the implementing non- network and demand side options as considered in the option 5.