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SWARTLAND ELECTRICITY: RINGFENCING, COST OF SUPPLY AND TARIFF STUDY – 2022/2023 COSTS

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1. INTRODUCTION.

Swartland Municipality (Swartland) sanctioned a comprehensive electricity pricing study which contains 3 main components, more than that required by NERSA:

- Ringfencing electricity. The key objective of this part of the study is to establish the true cost and revenue of electricity supply in the municipality.
- The Cost of Supply study. The objective of the cost of supply study is to know the cost of supplying customers on each tariff and to compare this with the revenue from current tariffs and thus the cross-subsidies.
- Tariff study. The final step is to analyse the structure of the tariffs and how it differs from the cost structures and identify the cross subsidies within the tariffs and then to propose new tariffs.

This paper describes the details relating to all three components of the study undertaken for Swartland Municipality. It contains the detailed results for the whole area.

2. INITIAL ASSESMENT

This section summarises the findings in terms of the existing tariffs and related issues. This was determined through analysis of the existing tariffs and discussions with electricity staff:

Residential tariffs:

- Indigent tariff.
    - Energy charges
        - The first block rate is far below the Eskom purchase costs.
        - The second block is close to cover only the Eskom costs.
        - The third and fourth blocks exceed the Eskom costs.
    - No basic charge
    - No capacity charge

  This means that this tariff is heavily subsidised for low usage consumers.

- Prepaid and alternative
    - Energy charges
        - The first block rate is far below the Eskom purchase costs.
        - The second block is close to cover only the Eskom costs.
        - The third and fourth blocks exceed the Eskom costs.
    - No basic charge
    - No capacity charge

  This means that this tariff is heavily subsidised for low usage consumers.

- Households and Farming Consumers Non Indigent:
    - Energy charges
        - The first block rate is far below the Eskom purchase costs.
        - The second block is close to cover only the Eskom costs.
        - The third and fourth blocks exceed the Eskom costs.
    - Reasonable basic charge
    - No capacity charge

  High usage consumers overcharged and provides big incentive to move to renewables.

Commercial Tariffs

- Commercial Alternative and pre-paid.
  - No basic charge
  - No capacity charge

  This means that this tariff is heavily subsidised for low usage consumers.

- Normal
  - Single energy charge.
  - Reasonable basic charges based on capacity – steps too big

  General overcharge.

- Sport Grounds
  - Single energy charge.
  - No basic or capacity charge

  Subsidy to low usage consumers

- Industrial
  - Reasonable basic charge
  - High demand charge
  - No Access charge.
  - Reasonable energy charge.
  - No differentiation for MV

  No TOU.

- TOU for Bulk
  - Reasonable basic charge
  - No access charge
  - High demand charge
  - Reasonable energy charges
  - No reactive energy charge
  - No differentiation for MV

- SSEG tariff.
  - Different tariff for every category
  - Rather just ad additional basic charge
  - Export rate very low and not TOU.
  - Seasonal single energy rates

  These should be on TOU

- Wheeling charges
  - Basic charge too high
  - Should have no maximum demand and Access charges

3. METHODOLOGY SUMMARY

The NERSA cost of supply Framework describes the steps as shown in **Figure 1**. It is considered to be an oversimplification and does not cover all aspects.

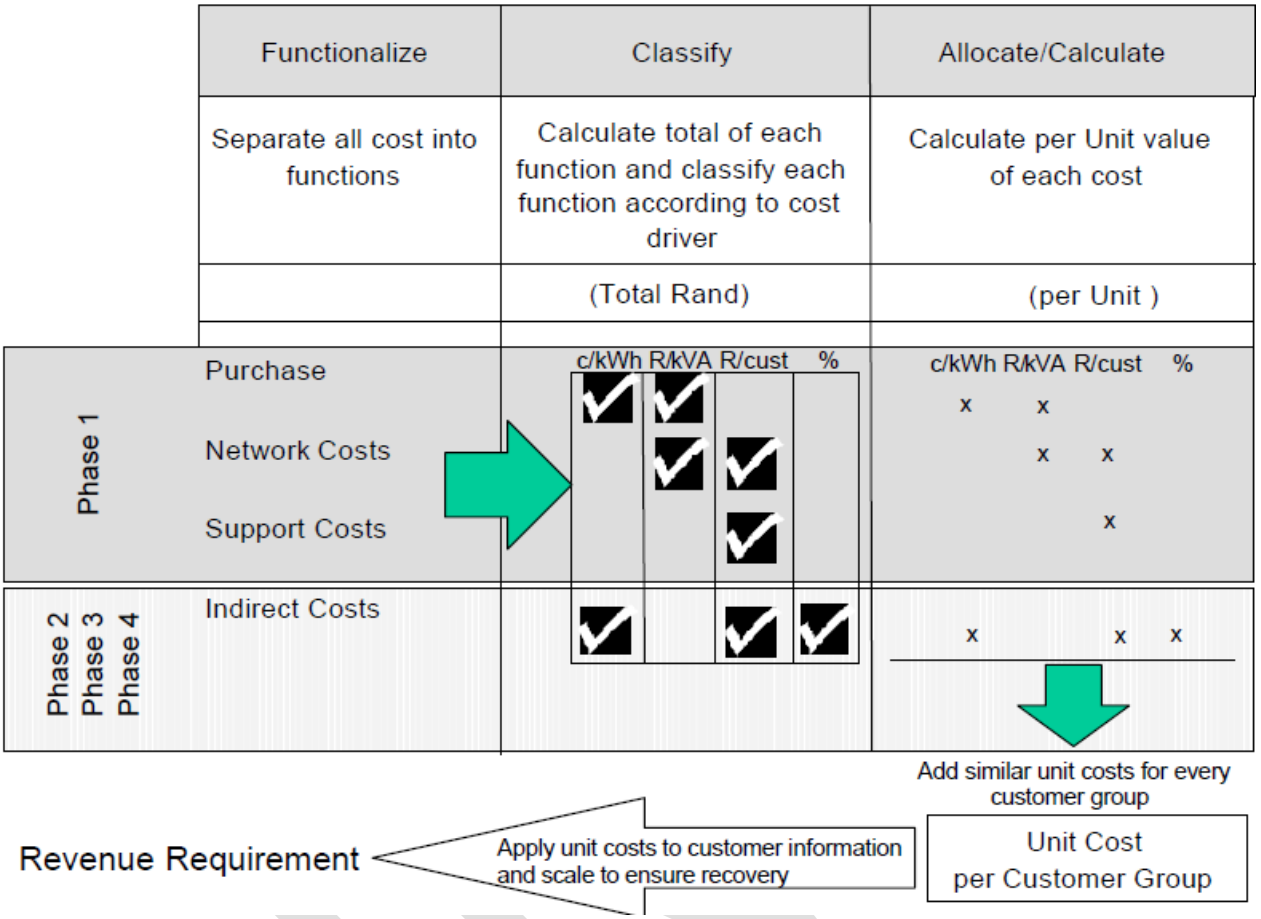
Figure 1

NRS058, the National Standard Specification “Cost of Supply Methodology for application in the Electrical

Distribution Industry", which was developed many years ago but never received final approval due to a legal dispute, shows the framework as in the

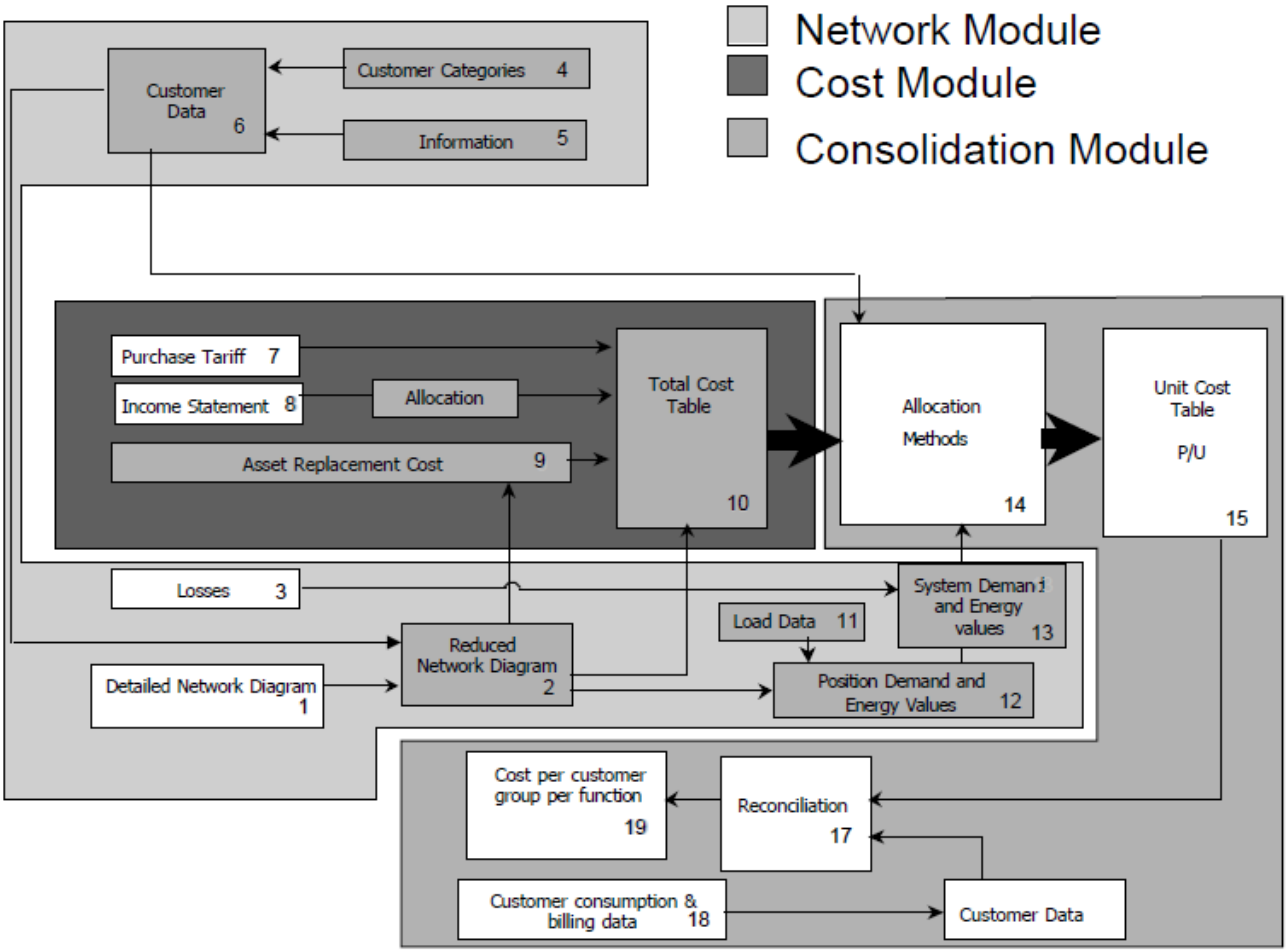
Figure 2.

Figure 2



Later in the NRS058 standard, a procedure diagram is provided as is shown in **Figure 3**. The NERSA framework does not feature any of these very important steps.

Figure 3



This report will thus follow the NERSA framework, but it must be realised that it is an over simplification of a much more complex process and thus feature many more steps. It must also be remembered that NRS058 was developed largely by an Eskom employee who only undertook cost of supply in Eskom. The issues of ring-fencing of electricity from the rest of the municipality do thus not feature in NRS058. For a proper study, Ringfencing must be done.

It is however proposed that anybody who really wants to appreciate the complexity of this cost of supply study should read the Interim NRS058 before reading this report.

Before starting with the ringfencing study, some background calculations need to be done as detailed in the next few sections.

4. NETWORK CAPITAL COST ANALYSIS

The first step in analysing network assets is to develop a Reduced network diagram (RND). **Figure 4** illustrates this for the Swartland network. Most rural supplies in the area are provided by Eskom.

Figure 4

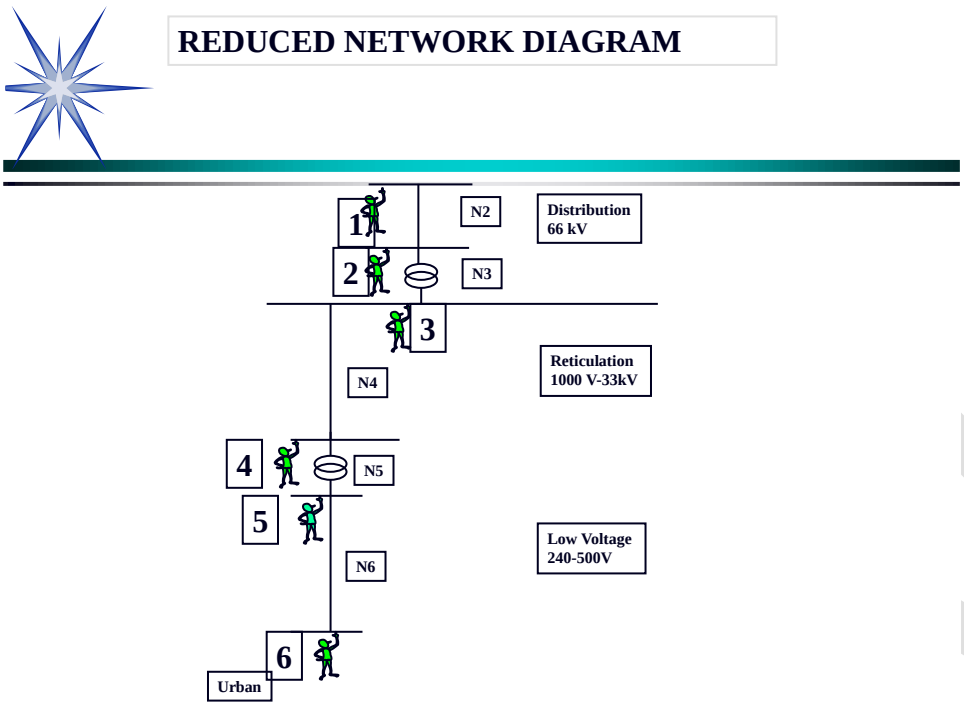


Table 1 shows the RND in table form. All costs and customers will be linked to these networks in the cost of supply study.

Table 1

SWARTLAND			
			Table 1
NETWORK CONSTRUCTION			
PRIMARY DESCRIPTION	SECONDARY DESCRIPTION	NETWORK CODE	VOLTAGE
Reticulation	Reticulation urban	N4	11 KV
Retic/LV transf	Retic subs urban	N5	11 KV to 400 V
LV	LV urban	N6	400 V

The following comments in this respect:

The summary of electrical assets in the financial assets register was studied and the following found:

- The asset descriptions are not detailed enough: transformer sizes and cable sizes not shown.
- This means that the replacement values cannot be determined from known projects.
- The values obtained by escalating the original costs to 2023 values at 6% per year yielded figures which cannot be used as they are too high.

The technical asset register was then obtained and studied.

The summary of the technical asset register with replacement values are shown in Table 2.

Table 2

Row Labels	Sum of Qty	Row Labels	Sum of Qty	Per unit values	Adjusted	New Unit cost	Replacement cost
Indoor_Switchgear	**16**	**Indoor_Switchgear**	**16**				**R -**
ABB	1	ABB	1				R -
Actom	3	Actom	3				R -
Reyrolle	12	Reyrolle	12				R -
Minisubstation	**201**	**Minisubstation**	**201**				**R 157 973 452**
1000 kVA (Oil)	4	1000 kVA (Oil)	4	R 446 384.00	2.29	R 1 022 219.36	R 4 088 877
1000 kVA (SF6)	1	1000 kVA (SF6)	1	R 446 384.00	2.29	R 1 022 219.36	R 1 022 219
1600 kVA (SF6)	1	1600 kVA (SF6)	1	R 550 300.00	2.29	R 1 260 187.00	R 1 260 187
200 kVA (Oil)	7	200 kVA (Oil)	7	R 300 000.00	2.29	R 687 000.00	R 4 809 000
300 kVA (Oil)	5	300 kVA (Oil)	5	R 329 500.00	2.29	R 754 555.00	R 3 772 775
315 kVA (Oil)	83	315 kVA (Oil)	83	R 329 500.00	2.29	R 754 555.00	R 62 628 065
315 kVA (SF6)	5	315 kVA (SF6)	5	R 329 500.00	2.29	R 754 555.00	R 3 772 775
400 kVA (Oil)	34	400 kVA (Oil)	34	R 340 550.00	2.29	R 779 859.50	R 26 515 223
500 kVA (Oil)	33	500 kVA (Oil)	33	R 348 900.00	2.29	R 798 981.00	R 26 366 373
500 kVA (SF6)	16	500 kVA (SF6)	16	R 348 900.00	2.29	R 798 981.00	R 12 783 696
630 kVA (Oil)	2	630 kVA (Oil)	2	R 390 798.00	2.29	R 894 927.42	R 1 789 855
630 kVA (SF6)	6	630 kVA (SF6)	6	R 390 798.00	2.29	R 894 927.42	R 5 369 565
800 kVA (Oil)	2	800 kVA (Oil)	2	R 414 284.00	2.29	R 948 710.36	R 1 897 421
800 kVA (SF6)	2	800 kVA (SF6)	2	R 414 284.00	2.29	R 948 710.36	R 1 897 421
MV_Cable	**116456**	**MV_Cable**	**116 456**		2.29		**R 127 832 767**
185x3 Al	12856	185x3 Al	12 856	R 501.03	2.29	R 1 147.36	R 14 750 443
185x3Cu	7379	185x3Cu	7 379	R 975.84	2.29	R 2 234.67	R 16 489 656
25x3 Cu	8216	25x3 Cu	8 216	R 315.63	2.29	R 722.79	R 5 938 465
300x3 Al	1670	300x3 Al	1 670	R 679.75	2.29	R 1 556.63	R 2 599 568
35x3 Cu	21710	35x3 Cu	21 710	R 352.26	2.29	R 806.68	R 17 512 923
50x3 Cu	3173	50x3 Cu	3 173	R 410.55	2.29	R 940.16	R 2 983 126
70x3 Al	1290	70x3 Al	1 290	R 302.64	2.29	R 693.05	R 894 029
70x3 Cu	34990	70x3 Cu	34 990	R 477.09	2.29	R 1 092.54	R 38 227 838
95x3 Al	10077	95x3 Al	10 077	R 351.98	2.29	R 806.03	R 8 122 407
95x3 Cu	15095	95x3 Cu	15 095	R 587.67	2.29	R 1 345.76	R 20 314 312
MV_OH_Line	**29646**	**MV_OH_Line**	**18 946**		2.29		**R 16 939 806**
Bare copper	80	Bare copper	80	R 271.18	2.29	R 621.00	R 49 680
Bare_copper	750	Bare_copper	750	R 309.12	2.29	R 707.88	R 530 914
Double Hare	8492	Double Hare	8 492	R 341.48	2.29	R 781.99	R 6 640 652
Double Oak	2476	Double Oak	2 476	R 271.18	2.29	R 621.00	R 1 537 601
Fox	2590	Fox	2 590	R 273.18	2.29	R 625.58	R 1 620 258
Hare	10560	Hare	10 560	R 271.18	2.29	R 621.00	R 6 557 783
Mink	4698	Mink	5	R 271.18	2.29	R 621.00	R 2 917
Pole_Transformer	**26**	**Pole_Transformer**	**26**		2.29		**R 4 868 655**
100 kVA	1	100 kVA	1	R 55 500.00	2.29	R 127 095.00	R 127 095
150 kVA	1	150 kVA	1	R 73 000.00	2.29	R 167 170.00	R 167 170
16 kVA	1	16 kVA	1	R 34 500.00	2.29	R 79 005.00	R 79 005
200 kVA	23	200 kVA	23	R 85 350.00	2.29	R 195 451.50	R 4 495 385
RMU	**59**	**RMU**	**59**		2.29		**R 33 777 500**
ABB Safe Ring	5	ABB Safe Ring	5	R 250 000.00	2.29	R 572 500.00	R 2 862 500
Alstom K	2	Alstom K	2	R 250 000.00	2.29	R 572 500.00	R 1 145 000
Areva FBX	15	Areva FBX	15	R 250 000.00	2.29	R 572 500.00	R 8 587 500
GEC T1OF	1	GEC T1OF	1	R 250 000.00	2.29	R 572 500.00	R 572 500
GEC T3OF	3	GEC T3OF	3	R 250 000.00	2.29	R 572 500.00	R 1 717 500
HS NX3F	1	HS NX3F	1	R 250 000.00	2.29	R 572 500.00	R 572 500
Lucy	2	Lucy	2	R 250 000.00	2.29	R 572 500.00	R 1 145 000
Schneider RM6	3	Schneider RM6	3	R 250 000.00	2.29	R 572 500.00	R 1 717 500
Unknown	27	Unknown	27	R 250 000.00	2.29	R 572 500.00	R 15 457 500
Transformers	**44**	**Transformers**	**44**		2.29		**R 19 803 863**
1000 kVA	7	1000 kVA	7	R 312 895.00	2.29	R 716 529.55	R 5 015 707
1250 kVA	4	1250 kVA	4	R 375 474.00	2.29	R 859 835.46	R 3 439 342
150 kVA	4	150 kVA	4	R 84 560.00	2.29	R 193 642.40	R 774 570
200 kVA	4	200 kVA	4	R 105 300.00	2.29	R 241 137.00	R 964 548
300 kVA	6	300 kVA	6	R 130 580.00	2.29	R 299 028.20	R 1 794 169
315 kVA	2	315 kVA	2	R 135 100.00	2.29	R 309 379.00	R 618 758
400 kVA	5	400 kVA	5	R 165 000.00	2.29	R 377 850.00	R 1 889 250
500 kVA	10	500 kVA	10	R 189 700.00	2.29	R 434 413.00	R 4 344 130
800 kVA	2	800 kVA	2	R 210 347.00	2.29	R 481 694.63	R 963 389
		Grand Total	**135 748**				**R 361 196 042**

These per unit replacement values were firstly determined by the municipality in 2016 Rand values. This was then escalated and compared with our own reference values and some adjustments made. These values are belied to be reasonable accurate.

The summary of values is shown in Table 3.

Table 3

NETWORK REPLACEMENT VALUES		Escelation	New value
MV Overhead lines	R 8 713 326.64	1.94	**R 16 939 806**
MV cable	R 55 517 273.90	2.30	**R 127 832 767**
Minisubstations	R 68 984 040.00	2.29	**R 157 973 452**
Transformers	R 4 699 609.00	4.21	**R 19 803 863**
Pole Trasformers	R 2 126 050.00	2.29	**R 4 868 655**
RMU	R 14 500 000.00	2.33	**R 33 777 500**
Protected Substations	R 39 124 000.00	**2.34**	R 91 441 740
LV Distribution network	R 73 226 700.00	**2.34**	R 171 147 554
LV Residential connections	R 97 619 470.00	**2.34**	R 228 159 039
LV Business connections	R 10 214 160.00	**2.34**	R 23 872 829
Streetlights	R 18 087 784.80	**2.34**	R 42 275 292
Traffic lights	R 1 800 000.00	**2.34**	R 4 207 012
TOTAL	**R 394 612 414.34**		R 922 299 509

An extract of NERSA technical D-form is shown in Table 4 below. The quantities tie up with the asset register quantities.

Table 4 Error! Reference source not found.

The depreciation and ROA making up the total Capital revenue requirement is shown in Table 5.

Table 5

Sum of Quantity	Sum of Quantity	Service connection	Meter Incl Inst	Current Replacement cost	Life expectancy Years	CRC Depreciation	ROA @ 3.5%	Total Capex provision	Current Depreciation	Current Interest	Total current provision	Capital ratios
Energy					15	-	-	-	-	-	-	**0.0%**
HV					50	-	-	-	-	-	-	**0.0%**
HV/MV					50	-	-	-	-	-	-	**0.0%**
MV				155 938 929	45	3 465 310	5 457 863	8 923 172	1 555 764	96 357	**1 652 121**	**11.1%**
MV to LV				239 377 912	40	5 984 448	8 378 227	14 362 675	2 686 740	147 916	**2 834 656**	**19.1%**
LV				149 473 846	35	4 270 681	5 231 585	9 502 266	1 917 338	92 362	**2 009 701**	**13.6%**
1 PH kWh Pre-paid	14 378	8 000	1 400	135 153 200	10	13 515 320	4 730 362	18 245 682	6 067 753	83 513	**6 151 267**	**41.5%**
3 PH kWh Pre-paid	1	10 000	2 500	12 500	10	1 250	438	1 688	561	8	**569**	**0.0%**
1 PH kWh	6 115	6 000	1 000	42 805 000	30	1 426 833	1 498 175	2 925 008	640 582	26 450	**667 032**	**4.5%**
3 Ph kWh	442	10 000	2 000	5 304 000	30	176 800	185 640	362 440	79 375	3 277	**82 652**	**0.6%**
3 TOU	283	20 000	10 000	8 490 000	30	283 000	297 150	580 150	127 054	5 246	**132 300**	**0.9%**
3 PH TOU & ct's	1	12 000	15 000	27 000	30	900	945	1 845	404	17	**421**	**0.0%**
TOU RMU & CT/VT's	5	450 000	20 000	2 350 000	30	78 333	82 250	160 583	35 168	1 452	**36 620**	**0.2%**
TOU at HV sub With CB	1	950 000	20 000	970 000	30	32 333	33 950	66 283	14 516	599	**15 116**	**0.1%**
Streetlight	5 305			40 595 899	15	2 706 393	1 420 856	4 127 250	1 215 045	25 085	**1 240 130**	**8.4%**
TOTALS	**26 531**			**780 498 286**		**31 941 602**	**27 317 440**	**59 259 042**	**14 340 302**	**482 283**	**14 822 584**	**100.0%**
											14 822 584	

The following in this respect:

- CRC depreciation – Calculated using the NERSA prescribed life expectancy.
- ROA - Return on Assets. The 3.5% is a real rate return considered internationally acceptable. This component is to cover the average cost of capital, including interest and return.

The process followed is to calculate the total capital provision as by international standards (depreciation plus ROA also called levelised cost) and then the ratio of these provisions relative to the total provision. Then apportion the current total provision (depreciation and interest) to the various asset categories using these ratios. These values will be used as a basis for the cost of supply analysis.

5. SALES.

All the municipal sales are managed through one financial (Promun) system. The summary report of all sales is shown in Table 6.

Table 6

		Inc Vat		3 395 435				From file 201 to 168 GWh	
Row Labels	**Sum of Sum of Count of Meter-ID**	**Sum of Sum of Sum of TranAmt**	**Sum of Sum of Sum of TotCons**	**Sum of Sum of Sum of Tier1-Cons**	**Sum of Sum of Sum of Tier2-Cons**	**Sum of Sum of Sum of Tier3-Cons**	**Sum of Sum of Sum of Tier4-Cons**	Sum of Consump	Sum of Consumpt
;	*3 545*	-	-	-	-	-	-		
Bulk kVA;Cust	*148*	72 701 966	***137 356***	137 356	-	-	-	(68 974)	
Bulk kVA;Dept	*22*	4 046 314	***11 411***	11 411	-	-	-	(10 611)	
Bulk;Cust	*243*	82 806 053	67 201 585	67 201 585	-	-	-	66 094 485	66 094 485
Bulk;Dept	*22*	3 075 405	861 456	861 456	-	-	-	1 833 698	1 833 698
Comm 20 kVA;Cust	*176*	2 817 193	746 101	740 445	-	-	-	691 548	691 548
Comm 20 kVA;Dept	*20*	220 841	54 424	54 424	-	-	-	54 424	54 424
Comm 20-40 kVA;Cust	*157*	5 099 729	2 610 505	2 620 002	-	-	-	2 134 707	2 134 707
Comm 20-40 kVA;Dept	*27*	522 889	164 970	160 845	-	-	-	164 988	164 988
Comm 40 kVA;Cust	*240*	17 352 079	5 830 518	5 878 512	-	-	-	5 305 264	5 305 264
Comm 40 kVA;Dept	*18*	427 107	149 121	153 109	-	-	-	119 561	119 561
Comm 15 Amp;Cust	*227*	904 166	356 120	148 006	171 942	-	-	320 947	320 947
Comm 15 Amp;Dept	*5*	61 723	20 658	2 383	18 275	-	-	18 782	18 782
Comm E;Cust	*116*	3 626 367	1 567 341	1 594 475	-	-	-	1 387 000	1 387 000
Comm E;Dept	*8*	92 620	41 325	41 433	-	-	-	41 325	41 325
Comm PP;Cust	*818*	15 420 580	4 448 325	4 422 142	39 806	-	-	4 440 326	4 440 326
Deernis;Cust	***6 224***	23 675 533	18 717 404	3 346 700	15 370 704	-	-	18 717 404	18 717 404
Dom 20 Amp;Cust	***360***	2 766 881	1 468 281	192 429	859 346	255 466	162 665	1 253 743	1 253 743
Dom PP;Cust	***6 976***	63 128 945	21 262 209	21 262 209	-	-	-	21 262 209	21 262 209
Dom SSEG;Cust	***66***	752 224	236 946	165 871	71 075	-	-	236 443	236 443
Dom SSG Exp;Cust	*66*	- 89 879	***72 411***	72 411	-	-	-	(41 201)	(41 201)
Domestic;Cust	***5 561***	76 851 631	27 031 007	2 920 584	14 102 210	5 788 712	4 260 072	25 230 462	25 230 462
Dor;Cust	*3 276*	- 6 588	***37 491 404***	248 071	-	-	-		
EquitS;Cust	*775*	- 2 072 205	***6 773***	6 773	-	-	-		
NA;NA		-	-	-	-	-	-	(31 210)	
NE;Cust	***106***	1 288 318	**89 010**	89 010	-	-	-		
Sport;Cust	*22*	105 174	28 266	10 989	17 278	-	-	25 741	25 741
Streetlights;Cust	*80*	602 213	421 954	421 954	-	-	-	256 232	256 232
Streetlights;Dept	*186*	1 467 335	1 047 248	1 046 948	-	-	-		
TOU Basic;Cust	*23*	300 533	-	-	-	-	-	-	-
TOU HS OP;Cust	*20*	1 834 989	*2 122 250*	2 122 250	-	-	-	2 122 250	2 122 250
TOU HS P;Cust	*20*	4 478 349	851 180	851 180	-	-	-	851 180	851 180
TOU HS S;Cust	*20*	3 823 510	2 400 699	2 400 699	-	-	-	2 400 699	2 400 699
TOU KVA;Cust	*23*	20 018 023	**73 173**	73 173	-	-	-	(67 562)	
TOU LS OP;Cust	*13*	4 320 535	5 634 383	5 634 383	-	-	-	5 634 383	5 634 383
TOU LS P;Cust	*13*	3 886 314	*2 212 259*	2 212 259	-	-	-	2 212 259	2 212 259
TOU LS S;Cust	*13*	7 689 862	*6 361 022*	6 361 022	-	-	-	6 361 022	6 361 022
Grand Total	**29 635**	**423 996 730**	**211 729 096**	**133 466 500**	**30 650 636**	**6 044 179**	**4 422 737**	-	-
Streetlights	7 129	317						168 951 523	169 129 880
Dor;Cust	3 276	(6 588)	37 491 404		-	-	-		
EquitS;Cust	775	- 2 072 205	6 773		-	-	-		
NE;Cust	106	1 288 318	89 010		-	-	-		
;	3 545	-	-		-	-	-		
Dom SSG Exp;Cust	66	(89 879)	72 411		-	-	-		
Bulk kVA;Cust	243		137 356		-	-	-		
Bulk kVA;Dept	22		11 411						
TOU KVA;Cust	20		73 173		-	-	-		
TOU LS OP;Cust	99				-	-	-		
Availability									
	14 354	**424 876 767**	**173 847 557**	**133 466 500**	**30 650 636**	**6 044 179**	**4 422 737**		
N-1	31 245	156 000	169 145 445		30633358.19	6044178.717	4422737.122		
	16 891	(424 720 767)	(4 702 112)		(17 278)	-	-		
	54.06%	-272256.95%	-2.78%		-0.06%	0.00%	0.00%		

The last column shows the changes required due to journals / adjustments done since the initial sales reports were generated..

Table 7 below shows the quantities from the income statement.

Table 7

SERVICE CHARGES	-	375 418 626
ELECTRICITY	-	375 418 626
Availability: Darling	-	402 087
Availability: Malmesbury	-	1 158 372
Availability: Moorreesburg	-	542 842
Availability: PPC	-	26 012
Availability: Yzerfontein	-	1 300 817
Consumption not Billed	-	1 621 339
Electricity Departmental Charges	-	11 983 328
Electricity Pre-paid: Darling		-
Electricity Pre-paid: Malmesbury		-
Electricity Pre-paid: Moorreesburg		-
Electricity Pre-paid: PPC		-
Electricity Pre-paid: Yzerfontein		-
Electricity: Chatsworth	-	1 704
Electricity: Darling	-	45 946 506
Electricity: Malmesbury	-	231 895 949
Electricity: Moorreesburg	-	60 336 129
Electricity: PPC	-	1 266 266
Electricity: Riebeek Kasteel	-	52 983
Electricity: Riebeek Wes	-	14 221
Electricity: Yzerfontein	-	24 820 735
Equitable share: Indigent Households		5 950 665
Reduction in Revenue		-

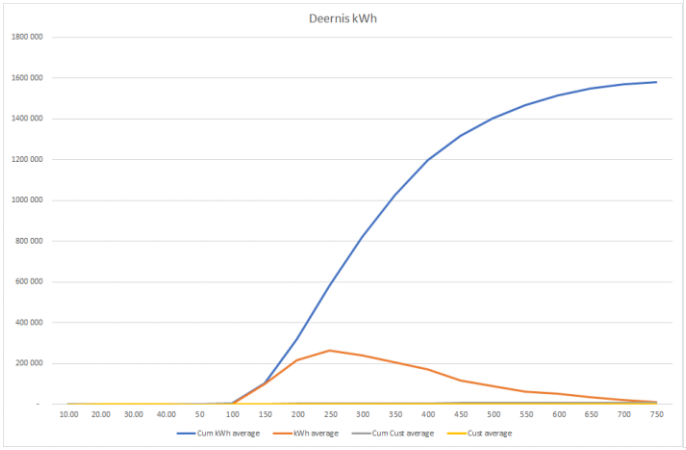
6. CUSTOMER CONSUMPTION PATTERNS.

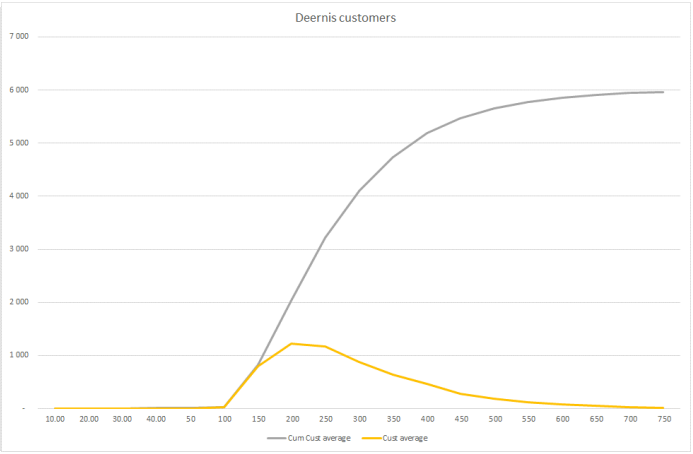
The sales are then analysed even further to determine the number of consumers per consumption block. This is important when deliberating about categorising consumers and developing appropriate tariff structures and consumer impact. The tables and graphs below show a section of the analysis for each of the small consumer tariffs. In case of each tariff the graphs after each table illustrates this graphically:

- The first graphs show:
  - the cumulative kWh vs each kWh block. (vertical axis)
  - the kWh per kWh block (horizontal axis)
- The second graphs show:
  - the cumulative consumers vs each kWh block. (vertical axis)
  - the consumers per kWh block. (horizontal axis)

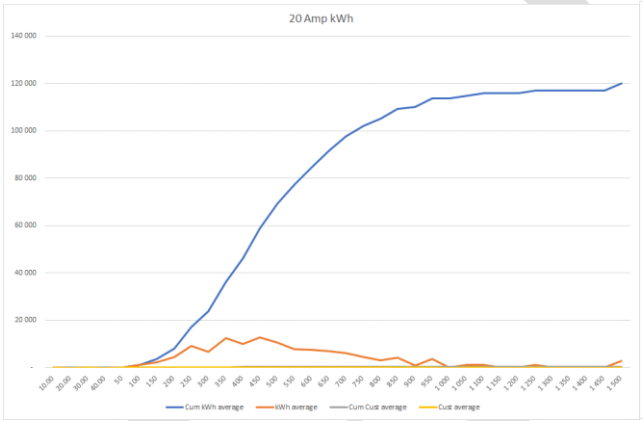
Indigent consumers.

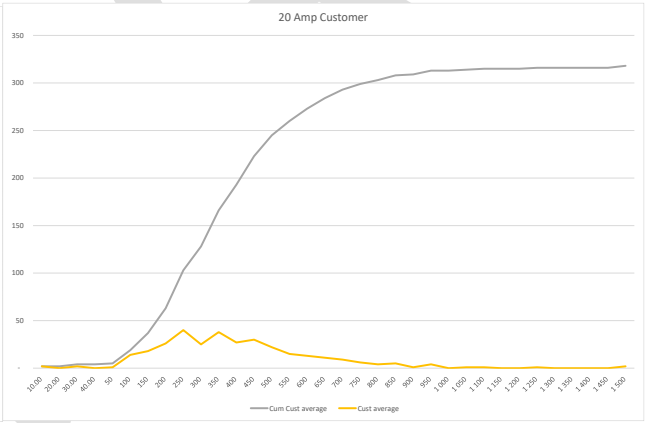
Deernis	Average														
	10.00	20.00	30.00	40.00	50	100	150	200	250	300	350	400	450	500	550
Cum kWh/m average	7	45	99	170	211	2 016	103 060	317 427	581 109	821 511	1 027 341	1 198 692	1 316 296	1 404 271	1 466 384
kWh/m average	7	39	53	71	41	1 804	101 044	214 367	263 682	240 402	205 830	171 351	117 604	87 975	62 114
Cum Cust average	1	4	6	8	9	31	824	2 043	3 220	4 097	4 731	5 192	5 469	5 655	5 774
Cust average	1	3	2	2	1	22	793	1 219	1 177	877	634	461	277	186	119
Block	50	350	600	> 600	Check	Check	BREAKEVEN		Amps	20	30.00	40.00	50.00	60.00	70.00
kWh/y	2 536	12 325 551	6 264 449	884 368	19 476 904	19 456 993			kWh/m	550.00	650.00	800.00	950.00	1 050.00	1 200.00
Customers	9	4 722	1 183	93	6 007	6 006			Customers	5 774	140	63	18	5	4



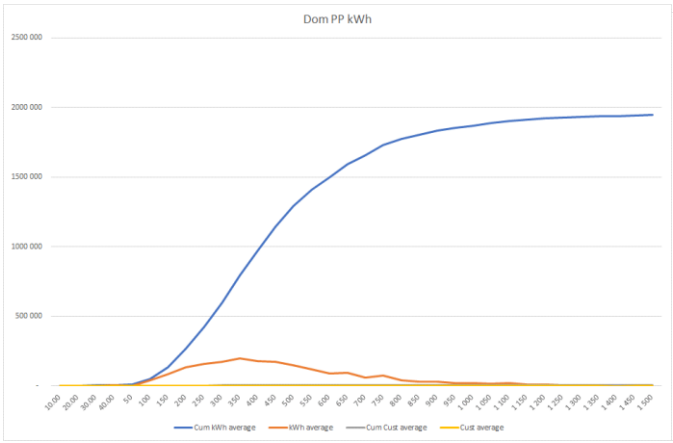


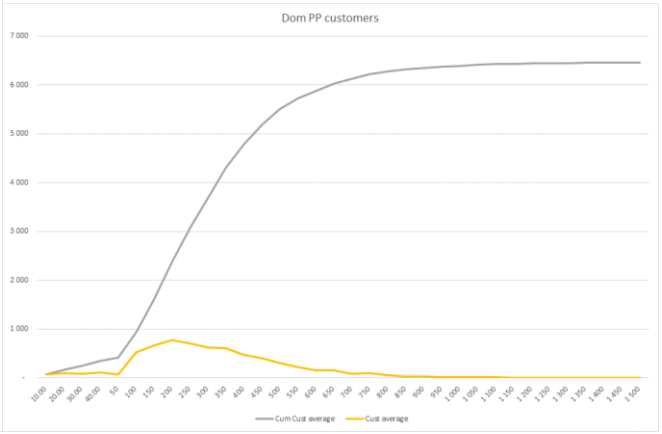
Dom 20 Amp	Average													
	10.00	20.00	30.00	40.00	50	100	150	200	250	300	350	400	450	500
Cum kWh average	5	5	56	56	101	1 192	3 539	7 959	17 028	23 774	36 181	46 258	58 971	69 406
kWh average	5	-	51	-	45	1 091	2 347	4 420	9 069	6 747	12 406	10 077	12 713	10 435
Cum Cust average	2	2	4	4	5	19	37	63	103	128	166	193	223	245
Cust average	2	-	2	-	1	14	18	26	40	25	38	27	30	22
Block	50	350	600	> 600	Check	Check	BREAKEVEN		Amps	20	30.00	40.00	50.00	60.00
kWh/y	1 213	432 954	665 660	382 528	1 482 355	1 441 362			kWh/m	550.00	650.00	800.00	950.00	1 050.00
Customers	5	161	118	36	320	318			Customers	260	24	19	10	1



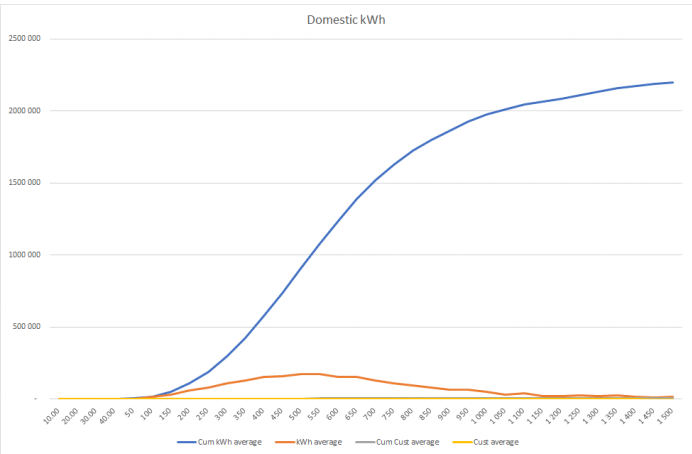


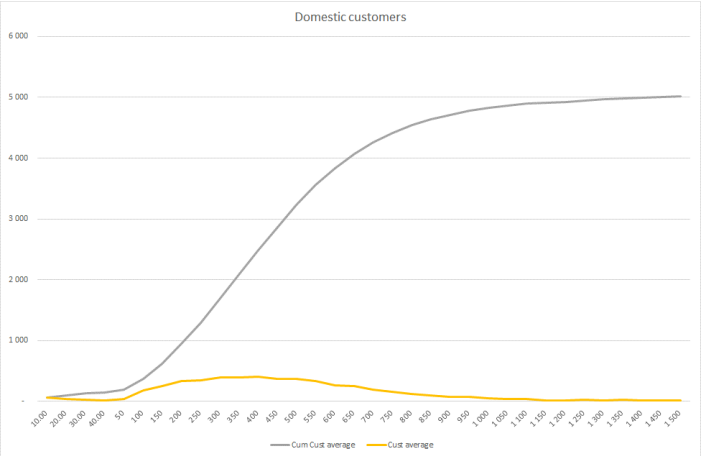
Dom PP	Average													
	10.00	20.00	30.00	40.00	50	100	150	200	250	300	350	400	450	500
Cum kWh average	379	1 819	3 888	7 594	10 552	49 815	132 922	267 749	426 401	597 630	794 763	972 575	1 144 652	1 292 297
kWh average	379	1 440	2 069	3 705	2 959	39 263	83 106	134 827	158 652	171 229	197 133	177 812	172 077	147 645
Cum Cust average	66	162	246	352	418	943	1 607	2 376	3 081	3 705	4 310	4 786	5 192	5 503
Cust average	66	96	84	106	66	525	664	769	705	624	605	476	406	311
Block	50	350	600	> 600	Check	Check	BREAKEVEN		Amps	20	30.00	40.00	50.00	60.00
kWh/y	126 628	9 410 524	9 605 370	4 428 616	23 571 139	23 363 147			kWh/m	550.00	650.00	800.00	950.00	1 050.00
Customers	418	3 892	1 728	435	6 473	6 463			Customers	5 733	305	249	90	36





Domestic	Average													
	10.00	20.00	30.00	40.00	50	100	150	200	250	300	350	400	450	500
Cum kWh average	237	785	1 526	2 156	4 050	17 389	48 892	107 610	185 764	294 602	423 279	576 064	735 137	909 671
kWh average	237	548	741	630	1 893	13 339	31 504	58 718	78 154	108 838	128 677	152 785	159 074	174 534
Cum Cust average	60	96	127	145	187	365	616	950	1 294	1 689	2 085	2 491	2 865	3 233
Cust average	60	36	31	18	42	178	251	334	344	395	396	406	374	368
Block	50	350	600	> 600	Check	Check	BREAKEVEN		Amps	20	30.00	40.00	50.00	60.00
kWh/y	48 594	5 030 751	11 598 098	10 279 089	26 956 532	26 416 663			kWh/m	550.00	650.00	800.00	950.00	1 050.00
Customers	187	1 898	1 991	964	5 040	5 014			Customers	3 564	512	465	235	82





This information is critical for the following:

- Determination of different tariff categories
- Determination of a cross-subsidised tariff for the poor that are not indigent.
- Selecting consumers on appropriate tariffs.

The following is clear from this information:

- There are a significant amount of consumers who use less than 350 kWh/m.
  - Indigent 4 722 out of 9006
  - 20 Amp 161 out of 360
  - Domestic PrePaid 3 892 out of 6463
  - Domestic Conventional 1 898 out of 5014

This clearly shows that there are many poor consumers that use very little and probably can't afford more even if they are not indigent. It is surprising that so few consumers are not on the 20 Amp tariff. The reason is almost certainly that the Domestic PrePaid tariff does not contain any fixed charges and energy charges are not that much higher than the tariff with fixed charges.

The value of a 15 / 20 Amp tariff must thus not be underestimated.

7. CUSTOMER / SALES / REVENUE ANALYSIS.

Before one can start classifying costs, some calculations need to be done which will be used in the classification process. It starts off with the analysis of customers, tariffs and revenue.

Table 8 shows the 2022/2023 and 2023/2024 tariffs. The current tariffs are used to ensure that any restructuring that was done during the last tariff change is incorporated.

Table 8

	Swartland Municipality									
	ELECTRICITY: TARIFF CHARGES TRADING SERVICES (Excluding VAT)								2022/2023	2023/2024	% Tariff Increase
1	Households and Farming Consumers Non Indigent:										
1	Residential Consumers (Houses, Flats & Farms) Network charge per month								R268.1100	R317.6835	18.49%
1	(0-50) kWh								R1.3523	R1.6024	18.49%
1	(51-350) kWh								R1.7388	R2.0603	18.49%
1	(351-600) kWh								R2.4471	R2.8996	18.49%
1	(>600) kWh								R2.8818	R3.4147	18.49%
2	Commercial :-										
2	Commercial / Non Standard Basic per Ampere per month								R12.5857	R14.9128	18.49%
2	Commerce / Non Standard (per kWh)								R2.2561	R2.6733	18.49%
2	Commerce Basic < 20KVA (Basic per month)								R681.9400	R808.0307	18.49%
2	Commerce Basic 20 to 40 KVA (Basic per month)								R896.9900	R1 062.8435	18.49%
2	Commerce Basic >40 KVA (Basic per month)								R1 637.0900	R1 939.7879	18.49%
2	Commerce Basic < 20KVA (per kWh)								R2.2561	R2.6733	18.49%
2	Commerce Basic 20 to 40 KVA (per kWh)								R2.2561	R2.6733	18.49%
2	Commerce Basic >40 KVA (per kWh)								R2.2561	R2.6733	18.49%
3	Bulk Industrial										
3	Maximum Demand Supply for Bulk Consumers: Network charge per month								R1 853.4290	R2 196.1280	18.49%
3	Plus: Active Energy - kWh								R0.8811	R1.0440	18.49%
3	Bulk Consumers - Maximum Demand per KVA per month								R356.5725	R422.5028	18.49%
4	Commercial Alternative < 15 AMP:-										
4	Per kWh								R3.0107	R3.5674	18.49%
5	Households Alternative <20 Amp:-										
5	(0-50) kWh								R1.2398	R1.4690	18.49%
5	(51-350) kWh								R1.6261	R1.9267	18.49%
5	(351-600) kWh								R2.3183	R2.7469	18.49%
5	(>600) kWh								R2.7861	R3.3013	18.49%
6	Streetlights - Internal Tariff										
6	Street Lights per kWh								R1.4272	R1.6910	18.49%
7	Pre-paid meter system (Indigent Residential)										
7	(0-50) kWh								R1.2398	R1.4690	18.49%
7	(51-350) kWh								R1.6261	R1.9267	18.49%
7	(351-600) kWh								R2.3183	R2.7469	18.49%
7	(>600) kW)								R2.7861	R3.3013	18.49%
8	Commercial Pre-paid:-										
8	Single Phase Per kWh								R3.0107	R3.5674	18.49%
8	Three Phase Per kWh								R3.0107	R3.5674	18.49%
9	Sports Grounds including maintenance of Floodlighting:-										
9	Per kWh								R4.4637	R5.2890	18.49%
10	Bulk Time Of Use Tariff: Alternative										
10	Time Of Use Tariff for Bulk Consumers: Fixed/Basic cost per month								R1 853.4290	R2 196.1280	18.49%
10	TOU Low Consumption season										
10	Peak (kWh)								R1.5276	R1.8101	18.49%
10	Standard (kWh)								R1.0513	R1.2457	18.49%
10	Off peak (kWh)								R0.6668	R0.7901	18.49%
10	TOU High Consumption season										
10	Peak (kWh)								R4.6834	R5.5494	18.49%
10	Standard (kWh)								R1.4187	R1.6811	18.49%
10	Off peak (kWh)								R0.7703	R0.9127	18.49%
10	Maximum Demand per KVA per month								R239.1461	R283.3642	18.49%
11	Net Metering Residential (for Approved SSEG Households)										
11	Monthly Basic Charge 1									R30.0000	New
11	Net Metering: Households Non-Indigent Basic per month								R268.1100	R317.6835	18.49%
11	Import Energy kWh (supplied by municipality) 1 < 600 kWh								R2.0475	R2.4260	18.49%
11	Import Energy kWh (supplied by municipality) 2 > 600 kWh								R2.8818	R3.4147	18.49%
11	Export Energy kWh (supplied to municipality-max/month <= import kWh)								R1.0846	R0.7715	-28.87%
12	Pre-paid Meter System (Non-Indigent Residential)										
12	(0-350) kWh								R2.5371	R3.0062	18.49%
12	(>350) kWh								R2.7626	R3.2734	18.49%
13	Net Metering Industrial (for Approved SSEG)								New Tariff		
13	Monthly Basic Charge 1									R30.0000	New
13	Monthly Basic charge 2									R2 196.1280	Refer Tariff 3
13	Maximum Demand Charge per kVA/month									R422.5028	Refer Tariff 3
13	Import Energy kWh (Supplied by the Municipality)									R1.0440	Refer Tariff 3
13	Export Energy kWh (Supplied to the Municipality: Max/month <= Import kWh)									R0.7715	New
14	Net Metering Commercial (for Approved SSEG)								New Tariff		
14	Monthly Baisc Charge 1 (Applicable to all Categories)									R30.0000	New
14	Net Metering Commercial;Basic Charge <= 20 kVA per month									R808.0307	Refer Tariff 2
14	Net Metering CommercialBasic Charge 21 - 40 kVA per month									R1 062.8435	Refer Tariff 2
14	Net Metering CommercialBasic Charge 41 - 50 kVA per month									R1 939.7879	Refer Tariff 2
14	Net Metering CommercialImport Energy kWh (Supplied by the Municiality)									R2.6733	Refer Tariff 2
14	Net Metering CommercialExport Energy kWh (Supplied to Municipality: Max/month <= Import kWh)									R0.7715	New
15	Net Metering Time of Use Bulk Consumers (for Approved SSEG)								New Tariff		
15	Monthly Basic Charge 1									R30.0000	New
15	Fixed Charge per month									R2 196.1280	Refer Tariff 10
15	Maximum Demand per KVA per month									R283.3642	Refer Tariff 10
15	Low Season (Sept - May) Peak period per kWh									R1.8101	Refer Tariff 10
15	Low Season (Sept - May) Standard period per kWh									R1.2457	Refer Tariff 10
15	Low Season (Sept - May) Off-peak period per kWh									R0.7901	Refer Tariff 10
15	High Season (Jun - Aug) Peak period per kWh									R5.5494	Refer Tariff 10
15	High Season (Jun - Aug) Standard Period per kWh									R1.6811	Refer Tariff 10
15	High Season (Jun - Aug) Off-peak Period per kWh									R0.9127	Refer Tariff 10
15	EXPORT Energy kWh (Supplied to Municipality: max/month <= limport kWh)									R0.7715	New
16	Wheeling Charges: Generator with a Wheeling Agreement with an Off-Taker								New Tariff		
16	Admin Charge per Month (to Off-Taker)									R500.0000	New
16	Network Charge per Month (to Generator)									R2 196.1280	Refer Tariff 10
16	Maximum Demand Charge: per kVA per month (to Generator)									R283.3642	Refer Tariff 10
16	Credit to Off-Taker (Must be on Tariff 10): Eskom Megaflex Rate - Losses (Losses at 6.50%)									Eskom Megaflex - Losses	New

Table 9 shows the 2023/2024 tariff charges for purpose of calculations and assessment.

Table 9

SWARTLAND		CHARGES APPLICABLE FOR ALL MONTHS OF THE YEAR								
year	30/06/2022	2022/2023 TARIFF RATES								
TARIFF CHARGES	M	Customer service	Basic	Access	MD (aLL hours)	ALL Energy	Block 1 kWh	Block 2 kWh	Block 3 kWh	Block 4 kWh
TARIFF NAME	TARIFF CODE	R/cust/m	R/POS/m	R/kVA/m	R/kVA/m	R/ kWh	50.000	350.000	600.000	>600
Pre-paid meter system (Indigent Residential)								R 1.9267	R 2.7469	R 3.3013
Households Alternative <20 Amp:-							R 1.4690	R 1.9267	R 2.7469	R 3.3013
Pre-paid Meter System (Non-Indigent Residential)							R 3.0062	R 3.2734		
Residential Consumers (Houses, Flats & Farms) Network charge per month			R 317.68				R 1.6024	R 2.0603	R 2.8996	R 3.4147
Residential Consumers (Houses, Flats & Farms) Network charge per month			R 317.68				R 1.6024	R 2.0603	R 2.8996	R 3.4147
Net Metering Residential (for Approved SSEG Households)			R 347.68				R 2.4260	R 3.4147		
Commercial Pre-paid:-						R 3.5674				
Commercial Alternative < 15 AMP:-						R 3.5674				
Commercial Alternative < 15 AMP:-Dept						R 3.5674				
Commerce / Non Standard (per kWh)				R 14.91		R 2.6733				
Commerce / Non Standard (per kWh)-Dept				R 14.91		R 2.6733				
Commerce Basic < 20KVA (Basic per month)			R 808.03			R 2.6733				
Commerce Basic < 20KVA (Basic per month)-Dept			R 808.03			R 2.6733				
Commerce Basic 20 to 40 KVA (Basic per month)			R 1 062.84			R 2.6733				
Commerce Basic 20 to 40 KVA (Basic per month)-Dept			R 1 062.84			R 2.6733				
Commerce Basic >40 KVA (Basic per month)			R 1 939.79			R 2.6733				
Commerce Basic >40 KVA (Basic per month)-Dept			R 1 939.79			R 2.6733				
Net Metering Commercial;Basic Charge <= 20 kVA per month			R 838.03			R 2.6733				-R 0.7715
Net Metering CommercialBasic Charge 21 - 40 kVA per month			R 1 092.84			R 2.6733				-R 0.7715
Net Metering CommercialBasic Charge 41 - 50 kVA per month			R 1 969.79			R 2.6733				-R 0.7715
Sports Grounds including maintenance of Floodlighting:-						R 5.2890				
Bulk Industrial			R 2 196.13		R 422.50	R 1.0440				
Bulk Industrial-Dept			R 2 196.13		R 422.50	R 1.0440				
Bulk Industrial mv			R 2 196.13		R 422.50	R 1.0440				
Net Metering Industrial (for Approved SSEG)			R 2 226.13		R 422.50	R 1.0440				-R 0.7715
Bulk Time Of Use Tariff: Alternative			R 2 196.13		R 283.36					
Bulk Time Of Use Tariff: Alternative MV			R 2 196.13		R 283.36					
Net Metering Time of Use Bulk Consumers (for Approved SSEG)			R 2 226.13		R 283.36					-R 0.7715
Net Metering Commercial;Basic Charge <= 20 kVA per month			R 838.03			R 2.6733				-R 0.7715
Net Metering CommercialBasic Charge 21 - 40 kVA per month			R 1 092.84							
Net Metering CommercialBasic Charge 41 - 50 kVA per month			R 1 969.79							
Streetlights - Internal Tariff						R 1.6910				
Wheeling Charges:			R 500.00	R 2 196.13	R 283.36					
Availability			R 200.00							

Table 10 shows the 2022/2023 consumptions details.

Table 10

SWARTLAND		QUANTITIES CHARGEBLE FOR ALL MONTHS OF THE YEAR								
CONSUMPTION		Number of customers	Number of POD's	Highest MD in year	Σ MDs all hours / 12	ALL Energy	Block 1 kWh	Block 2 kWh	Block 3 kWh	Block 4 kWh
TARIFF NAME	TARIFF CODE	Customers	POD's	kVA	kVA	kWh	kWh	kWh	kWh	kWh
Pre-paid meter system (Indigent Residential)			6 224	28 630		18 717 404	3 346 700	15 370 704	-	-
Households Alternative <20 Amp:-			360	1 656		1 253 743	192 429	859 346	255 466	162 665
Pre-paid Meter System (Non-Indigent Residential)			6 976	48 134		21 262 209	21 262 209	-	-	-
Residential Consumers (Houses, Flats & Farms) Network charge per month			5 561	51 161		25 230 462	2 920 584	14 102 210	5 788 712	4 260 072
Residential Consumers (Houses, Flats & Farms) Network charge per month				-						
Net Metering Residential (for Approved SSEG Households)			66	607		236 443	165 871	71 075	-	-
Commercial Pre-paid:-			818	5 644		4 440 326	4 422 142	39 806	-	-
Commercial Alternative < 15 AMP:-			227	1 044		320 947	148 006	171 942	-	-
Commercial Alternative < 15 AMP:-Dept			5	23		18 782	2 383	18 275	-	-
Commerce / Non Standard (per kWh)			116	1 601		1 387 000	1 594 475	-	-	-
Commerce / Non Standard (per kWh)-Dept			8	55		41 325	41 433	-	-	-
Commerce Basic < 20KVA (Basic per month)			176	1 214		691 548	740 445	-	-	-
Commerce Basic < 20KVA (Basic per month)-Dept			20	138		54 424	54 424	-	-	-
Commerce Basic 20 to 40 KVA (Basic per month)			157	2 889		2 134 707	2 620 002	-	-	-
Commerce Basic 20 to 40 KVA (Basic per month)-Dept			27	373		164 988	160 845	-	-	-
Commerce Basic >40 KVA (Basic per month)			240	8 280		5 305 264	5 878 512	-	-	-
Commerce Basic >40 KVA (Basic per month)-Dept			18	248		119 561	153 109	-	-	-
Net Metering Commercial;Basic Charge <= 20 kVA per month			-	-						
Net Metering CommercialBasic Charge 21 - 40 kVA per month			-	-						
Net Metering CommercialBasic Charge 41 - 50 kVA per month			-	-						
Sports Grounds including maintenance of Floodlighting:-			22			106	-	-	-	-
Bulk Industrial			144		49 793	27 015 513		-	-	-
Bulk Industrial-Dept			22		11 411	1 833 698		-	-	-
Bulk Industrial mv			4		87 564	39 078 972		-	-	-
Net Metering Industrial (for Approved SSEG)			-			-	-	-	-	-
Bulk Time Of Use Tariff: Alternative			19		18 105	3 883 928			-	-
Bulk Time Of Use Tariff: Alternative MV			3		55 068	15 697 865		-	-	-
Net Metering Time of Use Bulk Consumers (for Approved SSEG)			-			-	-	-	-	-
Net Metering Commercial;Basic Charge <= 20 kVA per month			-							
Net Metering CommercialBasic Charge 21 - 40 kVA per month			-					-	-	-
Net Metering CommercialBasic Charge 41 - 50 kVA per month										
Streetlights - Internal Tariff			8 603	317		256 232				
Wheeling Charges:										
Availability	R -		1 429	3 984						
178 463 113	169 145 445	5.22%	31 245	156 000	221 940	169 145 445	43 703 570	30 633 358	6 044 179	4 422 737
1.00			Losses		Purchase	178 535 523	5.26%	Losses		

Table 11 shows the 2022/2023 actual revenue from the sales reports.

Table 11

SWARTLAND		REVENUES FROM CHARGES APPLICABLE ALL MONTHS OF THE YEAR								
ACTUAL REVENUE		Customer service	Basic	Access	Σ MDs all hours	ALL Energy	Block 1 kWh	Block 2 kWh	Block 3 kWh	Block 4 kWh
TARIFF NAME	TARIFF CODE	R/year	R/year	R/year	R/year	R/year	R/year	R/year	R/year	R/year
Pre-paid meter system (Indigent Residential)	0					20 768 012				
Households Alternative <20 Amp:-	0					2 427 089				
Pre-paid Meter System (Non-Indigent Residential)	0					55 376 267				
Residential Consumers (Houses, Flats & Farms) Network charg	0		18 418 469			48 995 242				
Residential Consumers (Houses, Flats & Farms) Network charg	0		-							
Net Metering Residential (for Approved SSEG Households)	0		239 240			420 606				
Commercial Pre-paid:-	0					13 526 825				
Commercial Alternative < 15 AMP:-	0					793 128				
Commercial Alternative < 15 AMP:-Dept	0					54 143				
Commerce / Non Standard (per kWh)	0					3 181 024				
Commerce / Non Standard (per kWh)-Dept	0					81 245				
Commerce Basic < 20KVA (Basic per month)	0		1 482 677			988 546				
Commerce Basic < 20KVA (Basic per month)-Dept	0		168 486			25 234				
Commerce Basic 20 to 40 KVA (Basic per month)	0		1 739 702			2 733 745				
Commerce Basic 20 to 40 KVA (Basic per month)-Dept	0		299 184			159 491				
Commerce Basic >40 KVA (Basic per month)	0		4 853 683			10 367 439				
Commerce Basic >40 KVA (Basic per month)-Dept	0		364 026			10 629				
Net Metering Commercial;Basic Charge <= 20 kVA per month	0									
Net Metering CommercialBasic Charge 21 - 40 kVA per month	0									
Net Metering CommercialBasic Charge 41 - 50 kVA per month	0									
Sports Grounds including maintenance of Floodlighting:-	0					1 130 103				
Bulk Industrial	0		3 297 054		54 156 984	47 063 706				
Bulk Industrial-Dept	0		503 717		3 549 398	2 194 007				
Bulk Industrial mv	0		91 585		9 616 670	22 276 128				
Net Metering Industrial (for Approved SSEG)	0					-				
Bulk Time Of Use Tariff: Alternative	0		237 272	25%	4 344 829	9 621 614				
Bulk Time Of Use Tariff: Alternative MV	0		26 354	75%	13 214 841	13 214 841				
Net Metering Time of Use Bulk Consumers (for Approved SSEG	0					-				
Net Metering Commercial;Basic Charge <= 20 kVA per month	0									
Net Metering CommercialBasic Charge 21 - 40 kVA per month	0									
Net Metering CommercialBasic Charge 41 - 50 kVA per month	0									
Streetlights - Internal Tariff	0					1 815 393				
Wheeling Charges:	0									
Availability	0		3 430 130							
376 129 328	400 095 213	-6.4%	35 151 578	1	84 882 722	257 224 456	-	-	-	-

Table 12 shows the 2022/2023 consumptions statistics.

Table 12

SWARTLAND		CONSUMPTION STATISTICS FOR CHARGES APPLICABLE FOR ALL MONTHS OF THE YEAR								
CONSUMPTION STATISTICS		POD's / customer	MD-kVA/Cust	LF (annual)	LF (ave month)	Ave consump.	% 1 st block energy Vs total energy	% 2 nd block energy Vs total energy	% 3 rd block energy Vs total energy	% 4 th block energy Vs total energy
TARIFF NAME	TARIFF CODE	Ratio	%	%	%	kWh/cust/m	%			?
Pre-paid meter system (Indigent Residential)	0		4.60	7.46%		250.6	18%	82%	0%	0%
Households Alternative <20 Amp:-	0		4.60	8.64%		290.2	15%	69%	20%	13%
Pre-paid Meter System (Non-Indigent Residential)	0		6.90	5.04%		254.0	100%	0%	0%	0%
Residential Consumers (Houses, Flats & Farms) Network charge per	0		9.20	5.63%		378.1	12%	56%	23%	17%
Residential Consumers (Houses, Flats & Farms) Network charge per	0		#DIV/0!			#DIV/0!				
Net Metering Residential (for Approved SSEG Households)	0		9.20	4.45%		298.5	70%	30%	0%	0%
Commercial Pre-paid:-	0		6.90	8.98%		452.4	100%	1%	0%	0%
Commercial Alternative < 15 AMP:-	0		4.60	3.51%		117.8	46%	54%	0%	0%
Commercial Alternative < 15 AMP:-Dept	0		4.60	9.32%		313.0	13%	97%	0%	0%
Commerce / Non Standard (per kWh)	0		13.80	9.89%		996.4	115%	0%	0%	0%
Commerce / Non Standard (per kWh)-Dept	0		6.90	8.55%		430.5	100%	0%	0%	0%
Commerce Basic < 20KVA (Basic per month)	0		6.90	6.50%		327.4	107%	0%	0%	0%
Commerce Basic < 20KVA (Basic per month)-Dept	0		6.90	4.50%		226.8	100%	0%	0%	0%
Commerce Basic 20 to 40 KVA (Basic per month)	0		18.40	8.44%		1 133.1	123%	0%	0%	0%
Commerce Basic 20 to 40 KVA (Basic per month)-Dept	0		13.80	5.05%		509.2	97%	0%	0%	0%
Commerce Basic >40 KVA (Basic per month)	0		34.50	7.31%		1 842.1	111%	0%	0%	0%
Commerce Basic >40 KVA (Basic per month)-Dept	0		13.80	5.49%		553.5	128%	0%	0%	0%
Net Metering Commercial;Basic Charge <= 20 kVA per month	0		#DIV/0!			#DIV/0!				
Net Metering CommercialBasic Charge 21 - 40 kVA per month	0		#DIV/0!			#DIV/0!				
Net Metering CommercialBasic Charge 41 - 50 kVA per month	0		#DIV/0!			#DIV/0!				
Sports Grounds including maintenance of Floodlighting:-	0		-			0.4	0%	0%	0%	0%
Bulk Industrial	0		-		74.32%	15 634.0	0%	0%	0%	0%
Bulk Industrial-Dept	0		-		22.01%	6 945.8	0%	0%	0%	0%
Bulk Industrial mv	0		-		61.14%	814 145.2	0%	0%	0%	0%
Net Metering Industrial (for Approved SSEG)	0		#DIV/0!			#DIV/0!				
Bulk Time Of Use Tariff: Alternative	0		-		29.39%	17 034.8	0%	0%	0%	0%
Bulk Time Of Use Tariff: Alternative MV	0		-		39.05%	436 051.8	0%	0%	0%	0%
Net Metering Time of Use Bulk Consumers (for Approved SSEG)	0		#DIV/0!			#DIV/0!				
Net Metering Commercial;Basic Charge <= 20 kVA per month			#DIV/0!			#DIV/0!				
Net Metering CommercialBasic Charge 21 - 40 kVA per month			#DIV/0!			#DIV/0!				
Net Metering CommercialBasic Charge 41 - 50 kVA per month			#DIV/0!			#DIV/0!				
Streetlights - Internal Tariff			0.04	9.24%		2.5	0%	0%	0%	0%
Wheeling Charges:			#DIV/0!			#DIV/0!				
Availability			2.79	0.00%		-				
Total:		598 446	#DIV/0!	0	0	269 973 000.310	0.258			

These values all makes sense and will thus be used as such.

Table 13 shows the calculated revenue by multiplying the 2022/2023 consumption by the 2023/2024 tariffs.

Table 13

1	SWARTLAND	30/06/2022	REVENUES FROM CHARGES APPLICABLE FOR ALL MONTHS OF THE YEAR								
1	CALCULATED REVENUE		Customer service	Basic	Access	MD (aLL hours)	ALL Energy	Block 1 kWh		Block 3 kWh	Other charges
1	TARIFF NAME	TARIFF CODE	R/year	R/year	R/year	R/year	R/year	R/year		R/year	?
1	Pre-paid meter system (Indigent Residential)	0	-	-	-	-	-	-	29 615 493	-	-
1	Households Alternative <20 Amp:-	0	-	-	-	-		282 676	1 655 744	701 751	537 008
1	Pre-paid Meter System (Non-Indigent Residential)	0	-	-	-	-		63 919 063	-	-	-
1	Residential Consumers (Houses, Flats & Farms) Network charge per	0	-	21 199 658	-	-	-	4 679 804	29 054 675	16 784 865	14 546 697
1	Residential Consumers (Houses, Flats & Farms) Network charge per	0	-	-	-	-	-	-	-	-	-
1	Net Metering Residential (for Approved SSEG Households)	0	-	275 365	-	-	-	402 412	242 697	-	-
1	Commercial Pre-paid:-	0	-	-	-	-	15 840 417	-	-	-	-
1	Commercial Alternative < 15 AMP:-	0	-	-	-	-	1 144 946	-	-	-	-
1	Commercial Alternative < 15 AMP:-Dept	0	-	-	-	-	67 003	-	-	-	-
1	Commerce / Non Standard (per kWh)	0	-	-	286 469	-	3 707 867	-	-	-	-
1	Commerce / Non Standard (per kWh)-Dept	0	-	-	9 878	-	110 474	-	-	-	-
1	Commerce Basic < 20KVA (Basic per month)	0	-	1 706 561	-	-	1 848 714	-	-	-	-
1	Commerce Basic < 20KVA (Basic per month)-Dept	0	-	193 927	-	-	145 492	-	-	-	-
1	Commerce Basic 20 to 40 KVA (Basic per month)	0	-	2 002 397	-	-	5 706 709	-	-	-	-
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	0	-	344 361	-	-	441 063	-	-	-	-
1	Commerce Basic >40 KVA (Basic per month)	0	-	5 586 589	-	-	14 182 556	-	-	-	-
1	Commerce Basic >40 KVA (Basic per month)-Dept	0	-	418 994	-	-	319 623	-	-	-	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	0	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	0	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	0	-	-	-	-	-	-	-	-	-
1	Sports Grounds including maintenance of Floodlighting:-	0	-	-	-	-	561	-	-	-	-
1	Bulk Industrial	0	-	3 794 909	-	21 037 506	28 203 658	-	-	-	-
1	Bulk Industrial-Dept	0	-	579 778	-	4 821 162	1 914 345	-	-	-	-
1	Bulk Industrial mv	0	-	105 414	-	36 995 981	40 797 669	-	-	-	-
1	Net Metering Industrial (for Approved SSEG)	0	-	-	-	-	-	-	-	-	-
1	Bulk Time Of Use Tariff: Alternative	0	-	500 717	-	5 130 411	-	-	-	-	-
1	Bulk Time Of Use Tariff: Alternative MV	0	-	79 061	-	15 604 199	-	-	-	-	-
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	0	-	-	-	-	-	-	-	-	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	0	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	0	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	0	-	-	-	-		-	-	-	-
1	Streetlights - Internal Tariff	0	-	-	-	-	433 296	-	-	-	-
1	Wheeling Charges:	0	-	-	-	-	-	-	-	-	-
1	Availability	0	-	3 430 130	-	-	-	-	-	-	-
1	377 258 758	428 466 906	-	40 217 862	296 348	83 589 259	114 864 393	69 283 955	60 568 609	17 486 617	15 083 705
1		-	0	Err	13.57%	-	-	-	-	-	-

Table 14 shows a summary of the newly calculated revenue using the 2023/2024 tariffs compared with the 2022/2023 actual revenue.

Table 14

SWARTLAND				
CALCULATED REVENUE	TOTAL	Actual: Reference		
TARIFF NAME	R/year	Total	Difference	% Diff
Pre-paid meter system (Indigent Residential)	29 615 493	20 768 012	8 847 482	42.6%
Households Alternative <20 Amp:-	3 177 179	2 427 089	750 090	30.9%
Pre-paid Meter System (Non-Indigent Residential)	63 919 063	55 376 267	8 542 796	15.4%
Residential Consumers (Houses, Flats & Farms) Network charge per	86 265 699	67 413 711	18 851 988	28.0%
Residential Consumers (Houses, Flats & Farms) Network charge per	-	-	-	#DIV/0!
Net Metering Residential (for Approved SSEG Households)	920 475	659 846	260 629	39.5%
Commercial Pre-paid:-	15 840 417	13 526 825	2 313 592	17.1%
Commercial Alternative < 15 AMP:-	1 144 946	793 128	351 819	44.4%
Commercial Alternative < 15 AMP:-Dept	67 003	54 143	12 860	23.8%
Commerce / Non Standard (per kWh)	3 994 336	3 181 024	813 312	25.6%
Commerce / Non Standard (per kWh)-Dept	120 353	81 245	39 107	48.1%
Commerce Basic < 20KVA (Basic per month)	3 555 275	2 471 222	1 084 052	43.9%
Commerce Basic < 20KVA (Basic per month)-Dept	339 419	193 720	145 699	75.2%
Commerce Basic 20 to 40 KVA (Basic per month)	7 709 107	4 473 447	3 235 660	72.3%
Commerce Basic 20 to 40 KVA (Basic per month)-Dept	785 424	458 675	326 749	71.2%
Commerce Basic >40 KVA (Basic per month)	19 769 146	15 221 122	4 548 024	29.9%
Commerce Basic >40 KVA (Basic per month)-Dept	738 617	374 656	363 961	97.1%
Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!
Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	#DIV/0!
Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!
Sports Grounds including maintenance of Floodlighting:-	561	1 130 103	-1 129 543	-100.0%
Bulk Industrial	53 036 074	104 517 744	-51 481 670	-49.3%
Bulk Industrial-Dept	7 315 284	6 247 122	1 068 163	17.1%
Bulk Industrial mv	77 899 064	31 984 384	45 914 680	143.6%
Net Metering Industrial (for Approved SSEG)	-	1	-1	-100.0%
Bulk Time Of Use Tariff: Alternative	11 001 518	14 203 714	-3 202 197	-22.5%
Bulk Time Of Use Tariff: Alternative MV	37 389 029	26 456 036	10 932 993	41.3%
Net Metering Time of Use Bulk Consumers (for Approved SSEG)	-	-	-	#DIV/0!
Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!
Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	#DIV/0!
Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!
Streetlights - Internal Tariff	433 296	1 815 393	-1 382 097	-76.1%
Wheeling Charges:	-	-	-	#DIV/0!
Availability	3 430 130	3 430 130	-	0.0%
377 258 758	428 466 906	377 258 758	51 208 148	**13.57%**

It is very important to note the following:

- NERSA approved a general price increase of 15.1% for 2023/2024.
- Swartland applied to NERSA for a higher increase of 18.49% which NERSA did not approve.
- The actual revenue realised using the 2023/2024 actual tariffs applied only realised a revenue of 13.57% higher than in 2022/2023.
- This shows that the 18.49% increase was the correct increase to protect the municipality against the impact of reduced sales.

These values will be used to calculate various cost of supply factors.

8. NETWORK LOSSES.

The losses in the network are required in various instances. The first step is to determine the amount of energy flowing through each of the networks for each representative load profile. This is done by obtaining the kWh from each customer category from the actual consumption table and allocating it to the relevant point on the network. The result is shown in Table 15.

Table 15

SWARTLAND													
kWh CONNECTED BY NETWORK													
Supply position	MV at HV sub	MV	Ind	Mun	Comm	Dom	SSEG	SSEG E	Res	Res Poor	Lights		
	P01	P01	P02	P03	P03	P04	P05	P06	P06	P07	P08		Total
S00	0	0	0	0	0	0	0	0	0	0	0		0
S01	0	0	0	0	0	0	0	0	0	0	0		0
S02	0	0	0	0	0	0	0	0	0	0	0		0
S03	0	0	0	0	0	0	0	0	0	0	0		0
S04	0	54 776 837	0	0	0	0	0	0	0	0	0		54 776 837
S05	0	0	30 899 441	1 833 698	0	0	0	0	0	0	0		32 733 140
S06	0	0	0	399 080	14 279 897	46 492 670	236 443	0	0	19 971 147	256 232		81 635 469
S07	0	0	0	0	0	0	0	0	0	0	0		0
S08	0	0	0	0	0	0	0	0	0	0	0		0
S09	0	0	0	0	0	0	0	0	0	0	0		0
	0	54 776 837	30 899 441	2 232 779	14 279 897	46 492 670	236 443	0	0	19 971 147	256 232	0	169 145 445
											Bulk +SSEG		178 535 523
											Difference		5.26%
													169 145 445
													-9 390 078

The next step in the process, to calculate the losses of every network component, is as follows:

- An estimate is made about the loss % for every network component. This is done by considering the impedances of individual network components, the numbers involved and the loads flowing through it.
- The total infeed loads are then added to the relevant losses for every network through which it flows and are then added to the loads through all other networks to yield the total load.
- The loss factors are then modified until the total load, as calculated, is equal to the total load supplied in bulk. This is done by modifying the first pass estimation loss factors by the loss adjustment factor.

The resultant calculations are shown in

Table 16 and
Table 17.

Table 16

SWARTLAND												Table 10
ENERGY BALANCING												
kWh		FIRST PASS - BALANCE TOTALS BY CHANGING LOSS FACTORS ONLY										
Input at each network.				KWH								MAX
Supply		Through	Grand	HIGH SEASON				LOW SEASON				DEM
position	kWh/y	Network	Total	P	S	O	Tot	P	S	O	Tot	Tot kWh	kVA
		TOTAL	178 535 523	8792918	21228881	21322952	47360424	21363811.99	51509133.53	54245416.09	130 969 538	178 329 962	421 624
S0	0	NL0	178 535 638	7216286	19647601	20496537	47360424	20906405.86	51210793.96	58852338.48	130 969 538	178 329 962	386 780
S1	0	NL1	178 535 638	7 216 286	19 647 601	20 496 537	47 360 424	20 906 406	51 210 794	58 852 338	130 969 538	178 329 962	386 780
S2	0	NL2	178 535 638	7216286	19647601	20496537	47360424	20906405.86	51210793.96	58852338.48	130 969 538	178 329 962	386 780
S3	0	NL3	176 940 716	7212982	19633112	20439958	47286051	20898042.81	51179509.93	58689757.89	130 767 311	178 053 362	386 554
S4	54 776 837	NL4	174 306 259	7149117	19459275	20258977	46867368	20713006.17	50726353.4	58170103.7	129 609 463	176 476 832	383 132
S5	32 733 140	NL5	117 393 824	5087089	13924755	13376606	32388450	14490195.63	34878089.32	37354257.1	86 722 542	119 110 992	293 140
S6	81 635 469	NL6	81 635 469	3681208	10350026	9488595	23519829	10264363.47	24469277.97	26299003.42	61 032 645	84 552 474	235 432
S7	0	NL7	0	0	0	0	0	0	0	0	-	-	-
S8	0	NL8	0	0	0	0	0	0	0	0	-	-	-
S9	0	NL9	0	0	0	0	0	0	0	0	-	-	-
	169 145 445												

COMPARISONS		KWH								MAX	
Supply	Grand	Low Season				High Season				DEM	
position	Total	Sub-tot	Off-peak	Standard	Peak	Sub-tot	Off-peak	Standard	Peak	Tot kWh	KVA
Bulk Purchases	178535523.5	8 792 918	21 228 881	21 322 952	47 360 424	21 363 812	51 509 134	54 245 416	130 969 538	178 329 962	421 624
Total calculated	178535638.1	7 216 286	19 647 601	20 496 537	47 360 424	20 906 406	51 210 794	58 852 338	130 969 538	178 329 962	386 780
Difference	(114.64)	###########	(1 581 280.11)	(826 414.67)	-	(457 406.12)	(298 339.58)	4 606 922.38	-	-	(34 843.63)
% Difference	0.00%	-17.93%	-7.45%	-3.88%	0.00%	-2.14%	-0.58%	8.49%	0.00%	0.00%	-8.26%
Total losses	5.26%	5.26%									
Adjust losses to											
balance grand totals											

Losses adjustment	-40.44%

It is important to note that the losses refer to all losses from the Eskom infeed points right down to the customers connected on the LV network and include non-technical losses.

Table 17

SWARTLAND				
NETWORK LOSSES				
Supply position	**Per Network Estimate**	**Per Network Adjusted**	**Network Point**	**Total at Supply Point**
N0	0.00%	0.00%	S0	0.00%
N1	0.00%	0.00%	S1	0.00%
N2	0.00%	0.00%	S2	0.00%
N3	1.50%	0.89%	S3	0.89%
N4	2.50%	1.49%	S4	2.40%
N5	3.00%	1.79%	S5	4.23%
N6	6.00%	3.57%	S6	7.95%
N7	0.00%	0.00%	S6	7.95%
		Total losses		5.26%

These load loss factors will be used in calculating the costs per tariff cost category.

9. ESKOM ANALYSIS.

Swartland receives its electricity from Eskom from 6 points of supply. These are shown in **Table 18** as well as the tariff and the % on TOU.

Table 18

POINT OF SUPPLY	TARIFF	kWh	% of total	On TOU
Malmesbury.	Megaflex	101 628 623.34	57%	99.6%
Klipfontein	Megaflex	17 783 965.94	10%	
Moreesburg	Megaflex	26 261 670.46	15%	
Darling	Megaflex	21 692 610.75	12%	
Yzerfontein	Miniflex	10 368 666.75	6%	
PPC Ongegund	Nightsave Rural	651 240.26	0%	
PPC Village	Landrate	76 335.00	0%	
TOTAL		178 463 112.50		

These actual kWh and Rand values are summarised to represent the total purchase costs for Swartland as shown in

Table 19**.**

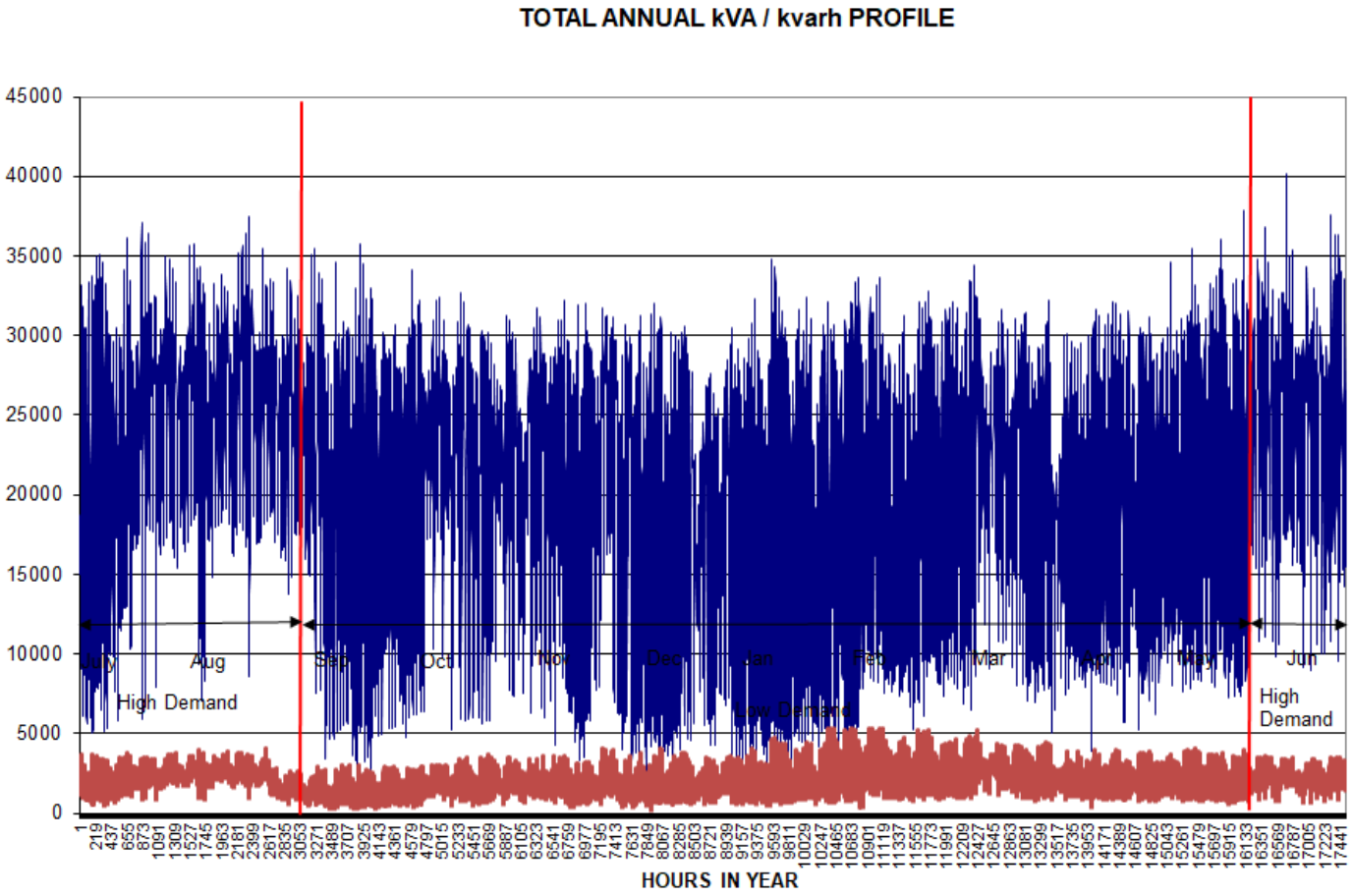
Table 19

SUMMARY	TOTALS ALL TOWNS												
CONSUMPTION DETAILS (2022-06-26 - 2022-07-25)	2022-07-25)	2022-08-25)	2022-09-25)	2022-10-25)	2022-11-25)	2022-12-25)	2023-01-25)	2023-02-25)	2023-03-25)	2023-04-25)	2023-05-25)	2023-06-25)	Year Total
ADMINISTRATION CHARGE R 4019.70	R 26 070	R 26 656	R 28 485	R 26 345	R 26 279	R 26 241	R 26 796	R 25 525	R 25 236	R 26 488	R 26 171	R 26 279	R 316 573
TRANSMISSION NETWORK CAPACITY R 67411.67	R 656 422	R 622 222	R 592 244	R 573 263	R 566 823	R 567 736	R 568 498	R 571 679	R 570 851	R 590 130	R 597 086	R 640 939	R 7 117 893
DIST. NETWORK CAPACITY CHARGE R 131230.00	R 1 216 746	R 1 179 353	R 1 184 282	R 1 179 374	R 1 179 047	R 1 192 262	R 1 192 925	R 1 192 665	R 1 191 595	R 1 204 714	R 1 225 643	R 1 238 746	R 14 377 354
EXCESS	R 33 243	R 0	R 0	R 0	R 0	R 14 105	R 26 595	R 0	R 0	R 35 846	R 73 092	R 130 986	R 313 867
NETWORK DEMAND CHARGE R 246542.51	R 1 870 229	R 1 715 176	R 1 734 689	R 1 684 322	R 1 748 690	R 1 751 354	R 1 689 173	R 1 816 020	R 1 651 565	R 1 801 599	R 2 033 898	R 2 071 008	R 21 567 723
ANCILLARY SERVICE (ALL) R 11954.65	R 95 863	R 108 522	R 89 821	R 575 507	R 90 783	R 80 813	R 80 355	R 83 579	R 86 350	R 81 400	R 83 843	R 98 795	R 1 555 632
ENERGY CHARGE (PEAK) 350862.00 R 1661514.48	R 7 976 835	R 6 343 487	R 7 092 146	R 6 548 144	R 6 662 064	R 5 744 865	R 5 608 661	R 5 982 769	R 6 333 635	R 5 310 555	R 5 945 322	R 12 001 131	R 81 549 614
ENERGY CHARGE (OFF) 857460.00 R 671402.41	R 10 575 411	R 14 915 616	R 5 545 124	R 4 265 553	R 4 487 384	R 3 579 738	R 3 389 091	R 4 014 239	R 3 937 169	R 3 071 567	R 3 916 515	R 7 277 269	R 68 974 675
ENERGY CHARGE (STD) 809259.00 R 1167992.72	R 9 108 910	R 10 667 032	R 4 102 944	R 4 357 228	R 4 151 450	R 3 985 108	R 4 099 314	R 3 958 442	R 4 090 732	R 4 557 691	R 4 060 349	R 8 184 267	R 65 323 467
ELECTRIFICATION AND RURAL SUBS (ALL) R 23385	R 1 866 387	R 2 111 903	R 1 746 128	R 1 774 591	R 1 768 237	R 1 574 071	R 1 541 771	R 1 627 249	R 1 682 739	R 1 585 304	R 1 632 822	R 1 922 634	R 20 833 837
REACTIVE ENERGY 40009.00 R 8377.41	R 8 702	R 15 600	R 4 591	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 6 229	R 35 123
SERVICE CHARGE R 8917.50	R 212 244	R 204 956	R 207 931	R 212 878	R 207 971	R 212 878	R 213 874	R 196 165	R 210 885	R 207 971	R 212 878	R 207 971	R 2 508 603
REBILLED	R 0	-R 651 335	-R 37 857	R 0	-R 688 279	-R 172 746	R 0	R 0	R 0	R 0	R 0	R 0	-R 1 550 217
TOTAL CHARGES FOR BILLING PERIOD R 4213219.	R 33 667 457	R 37 279 584	R 22 310 925	R 21 217 601	R 20 220 844	R 18 576 819	R 18 457 448	R 19 488 727	R 19 801 152	R 18 493 659	R 19 828 013	R 33 817 394	R 283 159 622
-	R 33 667 457	R 37 279 584	R 22 310 925	R 21 217 601	R 20 220 844	R 18 576 819	R 18 457 448	R 19 488 727	R 19 801 152	R 18 493 659	R 19 828 013	R 33 817 394	**R 283 159 622**
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7	8	9	10	11	-	66	-	-	-	-	-	-
CONSUMPTION DETAILS (2022-06-26 - 2022-07-25)													
ENERGY CONSUMPTION OFF PEAK kWH 857460.25	6 904 182	7 375 463	5 883 077	6 357 205	6 056 973	5 814 280	5 980 908	5 775 376	5 968 386	6 649 680	5 924 057	6 699 306	75 388 892
ENERGY CONSUMPTION STD kWh 809259.25	6 517 546	7 585 402	6 390 528	6 225 872	6 319 192	5 492 261	5 380 239	5 743 206	6 026 539	5 054 828	5 663 970	6 988 308	73 387 890
ENERGY CONSUMPTION PEAK kWh 350862.00	2 684 243	3 123 451	2 693 965	2 602 860	2 752 549	2 160 673	2 029 292	2 429 464	2 395 333	1 860 457	2 384 114	2 775 870	29 892 271
ENERGY CONSUMPTION ALL kWh 2017581.50	16 105 971	18 084 316	14 967 570	15 185 937	15 128 713	13 467 314	13 204 399	13 928 046	14 390 258	13 564 965	13 972 140	16 463 484	**178 463 113**
DEMAND CONSUMPTION - OFF PEAK 5050.59	34 560	31 286	33 727	30 722	30 481	31 012	30 189	31 548	31 229	32 841	35 698	33 231	386 525
DEMAND CONSUMPTION - STD 5450.26	37 261	34 945	34 905	34 300	36 645	36 580	34 558	37 378	34 178	36 258	38 046	37 464	432 518
DEMAND CONSUMPTION - PEAK 5450.26	39 702	35 525	36 013	35 180	36 333	36 148	34 947	38 073	34 478	37 930	43 185	43 611	451 125
DEMAND READING - KW/KVA 5450.26	43 162	38 849	39 780	37 564	39 806	41 250	39 707	42 069	38 563	42 098	46 960	47 708	497 516
REACTIVE ENERGY - OFF PEAK 302269.75	1 407 528	1 489 041	706 318	912 739	1 046 635	1 123 354	1 363 382	1 706 315	1 617 605	1 694 456	1 324 770	1 332 265	15 724 409
REACTIVE ENERGY - STD 270069.25	1 347 306	1 513 059	960 791	1 108 482	1 301 214	1 211 832	1 283 429	1 725 391	1 675 828	1 288 911	1 268 688	1 409 340	16 094 272
REACTIVE ENERGY - PEAK 100984.25	486 043	541 840	345 636	415 059	504 219	445 181	456 199	706 037	622 828	441 379	486 638	497 912	5 948 970
EXCESS REACTIVE ENERGY 40008.95	136 384	165 166	118 839	111 990	124 748	142 157	148 570	120 345	95 682	86 050	64 551	63 678	1 378 158
LOAD FACTOR 51.00	217	258	217	206	216	189	198	192	205	167	160	191	2 416

Next is to analyse the load profiles of the supplies from Eskom. The ½ hourly profiles for the last financial year were obtained from Eskom for each of the points of supply.

Figure 5 shows the total ½ hourly KVA purchases (Y-Axis) for Swartland over the 12 months (X-Axis).

Figure 5

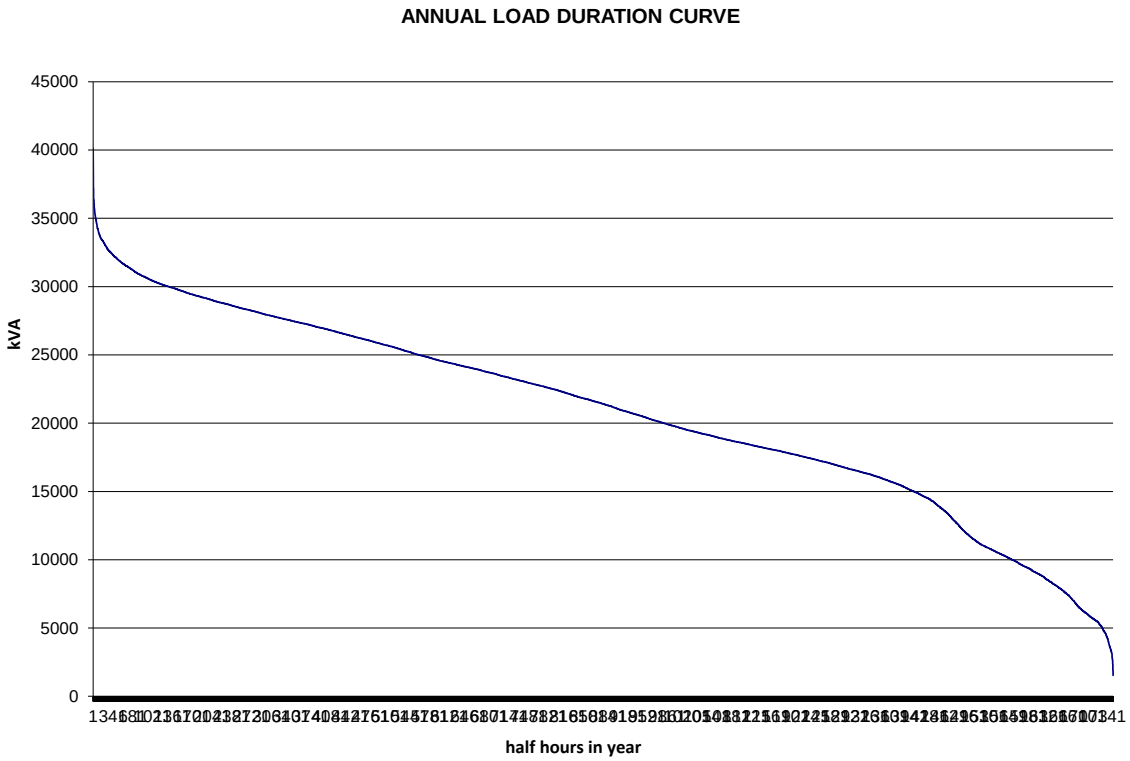


The following observations can be made from this:

- The highest peak was during the winter.
- This shows both the normal town winter peak as well as the typical December holiday peak.

Figure 6 shows the annual load duration curve. This shows the highest to the lowest ½ hourly kVA (Y-axis) for all the ½ hours of the year (x-axis) and gives an indication of the potential to reduce the peak demand.

Figure 6

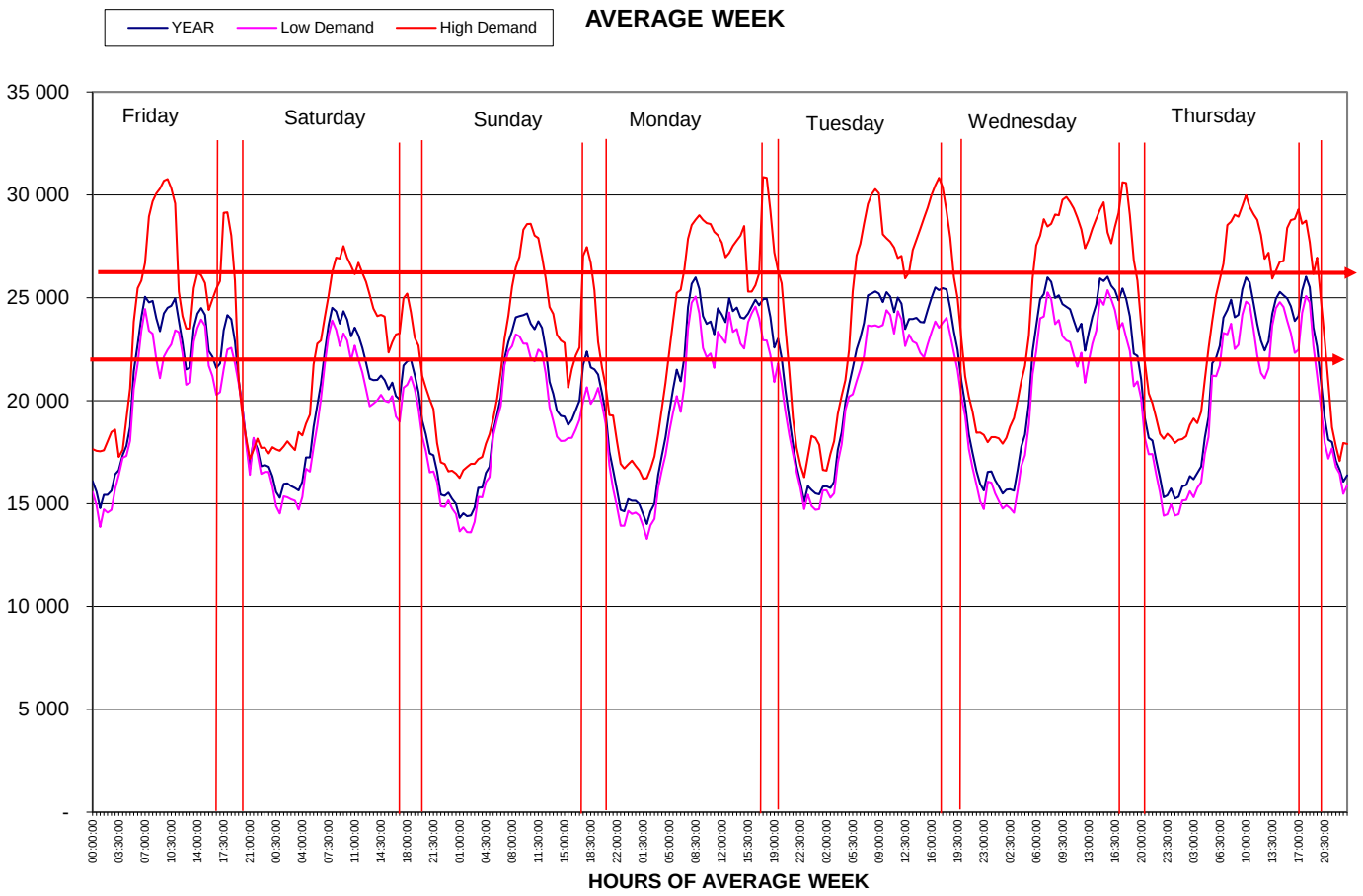


This shows that there is limited opportunity to save on maximum demand charges by only cutting out the peaks for a few hours in the year. Although the potential looks limited for the combined load, it will become clear that there are great opportunities to reduce peaks at each individual Eskom point of supply. Analysis shows that close to 5 MW can be further reduced by managing less than 40 peak hours in the year. This shows the importance of applying demand side management in the pricing signal to customers.

Figure 7 shows the ½ hourly kVA values (Y-axis) for the following average weeks (7 day ½ hours per week = x-axis) of the total Eskom supply in the year:

- Average for whole year.
- Average for high-demand period
- Average for low-demand period.

Figure 7

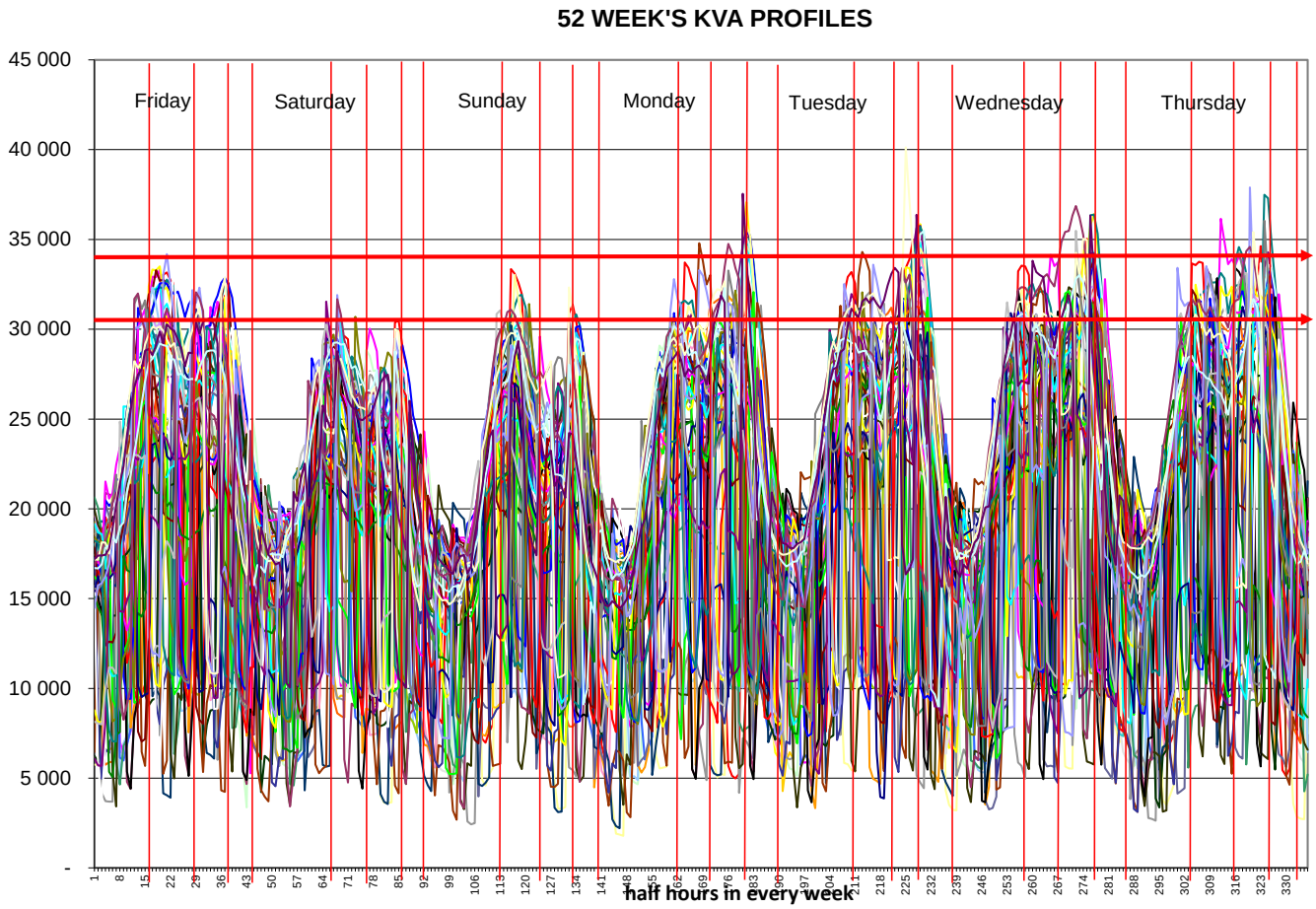


The following can be said in this respect:

- This is similar to other town profiles.
- It shows the very high evening peak especially in the High demand period (mainly from domestic customers).
- With the hot summers there is also a lower peak during the late mornings.
- It shows lower consumption on Saturdays and Sundays but late morning peaks on Sundays.
- Very low levels of consumption during the night.

Figure 8 Error! Reference source not found.shows the ½ hourly kVA values (Y-axis) for every week of the year (7 day ½ hours per week = x-axis). This is a very important graph as the previous average graph easily hides very important information.

Figure 8

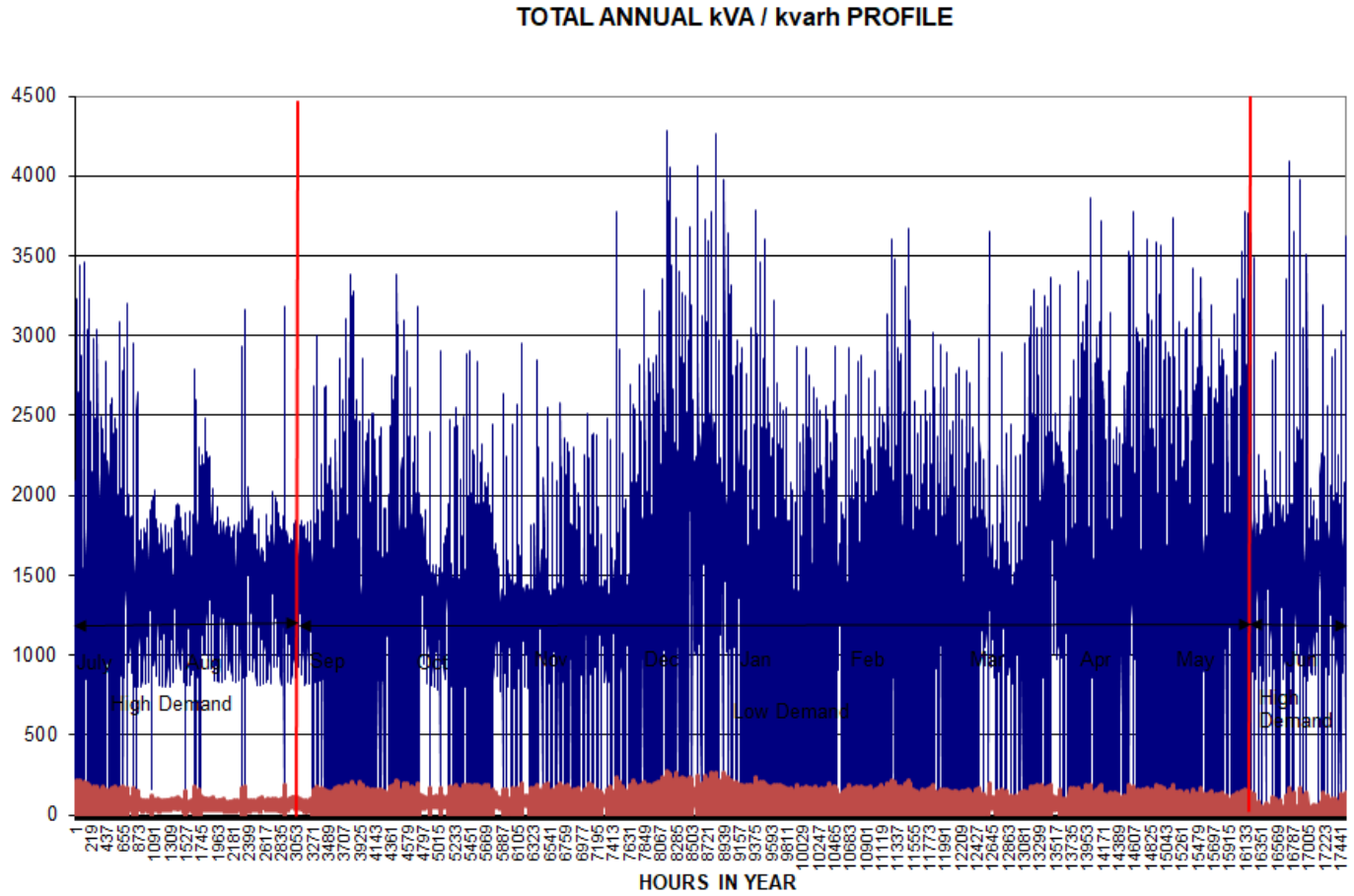


The following can be seen from this:

- On the highest peak day of the year, the evening peaks are dominant, but the morning peaks are moving closer.
- It also shows that there are only a few days in the year where the demand actually exceeds 37 MW. That leaves massive opportunity to save more than 5 MW with very limited effort.
- This is a clear message that the key focus for demand reduction must be on domestic evening peaks but the rising morning peaks cannot be ignored.

All the individual Eskom supply profiles were also analysed and all follow a similar pattern. Yzerfontein has a big seasonal characteristic and has a higher peak during the December / January period due to holiday period. The annual profile for Yzerfontein is shown in Figure 9.

Figure 9



10. RINGFENCING.

Before one can calculate the revenue requirement, a ringfencing study needs to be completed to determine the true costs and revenues and specifically overheads that should be charged to Electricity by the municipality. This means that the trial balance of the municipality and the NERSA D-form figures will be different due to a proper ringfencing process being followed.

Because it is best to do cost functionalization as early as possible in the process, it is done as part of the ringfencing study. In other words, the costs within electricity are identified and then costs are allocated from the various support functions in the municipality towards each of the various functions in electricity.

10.1. Key focus areas

There are a host of practices that affect the accuracy of the cost and revenue of current LG electricity distributors. The following ones will take the key attention:

The focus will firstly be on the larger items and thus the 20% of items that have 80% of the impact.

Services being supplied by Electricity to the rest of the Municipality where no charge is levied to cover the cost of supplying such service. The services involved here include the following: Electrical maintenance of Municipal facilities such as water works, sewerage works, buildings, houses etc.

Electricity equipment and other resources being used by the rest of the Municipality with no charge. This typically includes the following: Heavy vehicles, large machinery, meter readers etc.

Public lighting including streetlights, high mast lights, robots, parking lot lights, etc. This service is considered a Municipal service and not part of electricity supply although the service is provided by the electricity department.

Electricity for own use by the municipality. Many municipalities have a different set of tariffs for the supply of electricity for use by its own facilities, such as municipal buildings, stores, sewerage supplies, water pumping and sometimes also for staff. If these tariffs are not cost reflective it has the effect of distorting the true electricity supply cost/revenue and thus surplus. In some cases, an overcharge is made to the municipality in the tariff and in other cases an undercharge.

Services provided to the electricity department by the municipality. Typical services include the following: Meter reading and billing, revenue collection, general accounting and administration, telephones, stores, etc. The extent to which this is done, differs significantly between various distributors. The big problem here is the extent of allocation of these costs made to the electricity department:

- Administration and overheads are allocated in terms of turnover instead of more realistic allocation factors, such as the number of staff, the own costs, area of office space etc. The problem with this is that the purchase cost of electricity is close to 70% of the revenue and the tax (surplus) being levied by the municipality on electricity makes up a further approximately 20%. This method overstates the true share of the cost by the electricity department by more than 50%.
- Metering and billing costs should typically be allocated according to the share of the cost of the billing system with the number of transactions or actual processing time. Where the revenue is used as a basis, a misallocation is again made.
- A wide range of other methods are being used to allocate the other costs. There are internationally accepted methods that should be used to allocate the costs to ensure a fair burden on the electricity department.

Funding of capital expenditure. Assets in municipalities are mainly funded directly from profits / retained income and various grants received by the municipality. Some assets are still funded from external loans. The capital expenditure does not form part of the income statement, except in subsequent years when it appears as depreciation.

Government Grant funding. A large portion of municipal income is from Government Grants. These are used to subsidise charges to residents but also to fund operating and capital costs. This distorts the normal profitability of departments and complicates the fair allocation of costs and revenues. Proposals will however be made in this respect.

There are a host of practices that affect the accuracy of the cost and revenue of current municipal electricity distributors. The focus will firstly be on the larger items and thus the 20% of items that have 80% of the impact. It is one matter to develop a generic methodology to be applied. Things are always different because of the following:

- The way the municipality operates and is structured.
- The availability of data in the required format / level of detail.
- The need to focus on big values that have a significant impact.

10.2. Methodology applied

The process starts with an analysis of the Total Municipal Trial Balance for the completed financial year. These are the figures that are used as the basis for the compilation of the Annual Financial statements.

In analysing the Swartland data the following key steps were followed to achieve accurate ringfencing:

- The data was ordered as follows:
  - The head office, support and administrative functions. These are not considered primary service delivery but act as support to the various line functions and as such the line departments should cover their costs.
  - Community services, the economic services trading services. These are considered the primary service delivery to the community and need to carry all costs of the overheads and service departments.
- The various sub-departments and cost categories are grouped to make viewing practical.

This process is illustrated graphically in **Figure 10** below.

Figure 10

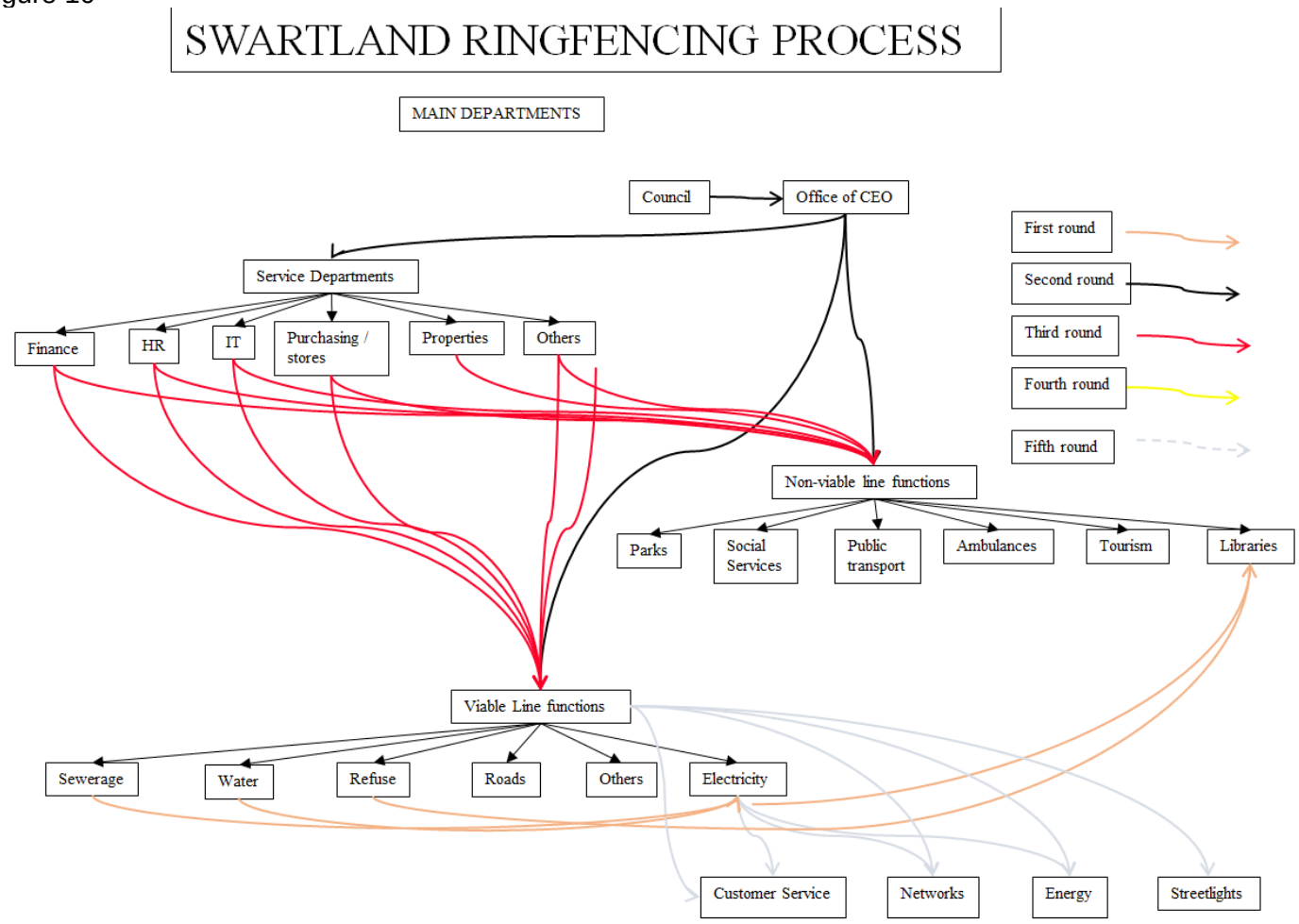


Table 20 shows the trial balance per group before any adjustments.
Table 20Table 20

Sum of TOTAL	C																
		IE															IE Total
		Appropriation Account Total	EXECUTIVE COUNCIL Total	FINANCE ADMIN Total	Total	PLANNING DEVELOPMENT Total	OTHER Total	HOUSING Total	SPORT RECREATION Total	COMMUNITY SOCIAL SERVICES Total	ROAD TRANSPORT Total	PUBLIC SAFETY Total	WASTE MANAGEMENT Total	WASTE WATER MANAGEMENT Total	WATER Total	ELECTRICITY Total	
Row Labels		SURPLUS/(DEFICIT) FOR YEAR			SUPPLY CHAIN MANAGEMENT		TOURISM										
CS																	
IE		138 212 047	35 706 926	- 185 663 451	4 920	10 945 181	2 306 782	4 534 409	27 954 427	10 412 046	37 463 670	46 897 896	4 402 183	- 28 139 541	- 37 775 724	- 67 261 772	- 0
SUB VOTE: Bonu			249 636		4 920												254 556
BAD DEBTS				866 725				- 1 532				- 7 950 342	411 415	475 436	924 286	- 204 237	- 5 478 249
DEPRECIATION: PROPERTY, PLANT AND EQUIPMENT			32 507	6 013 654		98 155	152	1 117 258	2 832 481	1 401 867	29 477 290	1 273 404	4 919 852	15 629 413	16 260 078	14 340 302	93 396 412
DONATED PROPERTY PLANT AND EQUIPMENT				- 116 522									- 2 250 000			- 3 776 952	- 6 143 474
EMPLOYEE RELATED COSTS - SOCIAL CONTRIBUTIONS			2 495 636	10 043 846		2 005 262	152 041	388 109	3 642 699	3 958 885	5 163 077	8 329 645	3 222 771	1 692 442	2 924 612	3 603 456	47 622 482
EMPLOYEE RELATED COSTS - WAGES SALARIES			11 143 138	41 593 074		9 923 062	544 683	1 996 475	19 459 424	17 355 060	23 071 894	43 927 755	18 583 276	10 946 801	19 267 098	19 553 220	237 364 959
FINES			- 652							- 12 221		- 34 471 600					- 34 484 473
GAINS ON DISPOSAL OF PROPERTY, PLANT AND EQUIPMENT				- 9 212 197													- 9 212 197
GENERAL EXPENSES: BULK PURCHASES				-							-			-	-	289 451 395	289 451 395
GENERAL EXPENSES: CONTRACTED SERVICES			190 953	1 599 839		11 848		-	230 400	107 014	-	786 242	8 356 296	666 432	598 233	719 160	13 266 418
GENERAL EXPENSES: DEPARTMENTAL										-			771 047	742 984	1 639 605	3 594 737	6 748 373
GENERAL EXPENSES: GRANTS AND SUBSIDIES PAID			2 544 314				1 511 272										4 055 585
GENERAL EXPENSES: INTER DEPARTMENTAL RECOVERIES				2 614 032			27 730		1 810 106	228 633	2 279 454	64 095	19 431	5 715 033	540 553	309 130	13 608 198
GENERAL EXPENSES: OTHER			8 228 818	26 437 335		3 852 174	85 744	22 434 638	3 338 743	1 594 705	5 276 360	42 011 274	13 266 726	7 331 479	43 705 732	6 553 225	184 116 953
GRANTS AND SUBSIDIES RECEIVED: CAPITAL							-	- 3 515 230	-	- 1 250 000	- 12 450 788	- 137 485	-	- 2 438 483	- 21 359 212	- 17 600 000	- 58 751 198
GRANTS AND SUBSIDIES RECEIVED: OPERATING			- 57 080	- 2 571 795		-		- 17 926 686	- 1 059 840	- 11 608 499	- 4 470 000	- 7 719 139	- 1 579 221	- 55 200	- 600 000	-	- 47 647 460
IMPAIRMENT LOSSES				- 517 741													- 517 741
INCOME FOR AGENCY SERVICES											- 5 511 479						- 5 511 479
INTER- DEPARTMENTAL CHARGES			-	-									- 771 047	- 742 984	- 1 639 605	- 3 594 737	- 6 748 373
INTEREST EARNED: EXTERNAL INVESTMENTS				- 58 939 305													- 58 939 305
INTEREST EARNED: OUTSTANDING DEBTORS				- 4 048 147													- 4 048 147
INTEREST EXPENSE			-	509 770					75 133		460 899	7 314	750	8 557 112	87 121	482 283	10 180 381
LESS REVENUE FOREGONE				1 974 748										1 823	-		1 972 925
LICENSES AND PERMITS			-							- 1 006	- 5 143 063						- 5 144 069
LOSS ON DISPOSAL OF PROPERTY, PLANT AND EQUIPMENT				11 650 494													11 650 494
OTHER REVENUE			- 355 762	- 2 654 208		- 4 945 805		- 196 470	- 578 526	- 962 121	- 490 240	- 145 283	- 2 653 895	- 6 798 368	- 3 983 806	- 1 830 090	- 25 594 573
PROPERTY RATES				- 143 072 705													- 143 072 705
PROPERTY RATES GOVERNMENT				- 11 003 233													- 11 003 233
REMUNERATION OF COUNCILLORS			11 225 004														11 225 004
RENT OF FACILITIES AND EQUIPMENT				- 769 671			- 14 839		- 3 922 012	- 308 741	- 30 193						- 5 045 457
REPAIRS AND MAINTENANCE			10 415	3 654 992		485		237 847	2 125 820	268 870	10 695 131	922 016	10 686 376	4 543 314	1 860 174	2 937 095	37 942 535
SERVICE CHARGES													- 31 878 660	- 45 780 628	- 83 195 598	- 375 418 626	- 536 273 512
Surplus / Deficit Transferred		138 212 047															138 212 047
TRANFERS REVENUE			-							- 360 400	- 10 864 672						- 11 225 071
UNCONDITIONAL AND OTHER GRANTS				- 59 716 436									- 16 702 934	- 28 622 500	- 14 804 997	- 6 381 133	- 126 228 000
Grand Total		138 212 047	35 706 926	- 185 663 451	4 920	10 945 181	2 306 782	4 534 409	27 954 427	10 412 046	37 463 670	46 897 896	4 402 183	- 28 139 541	- 37 775 724	- 67 261 772	- 0

All the main transactions were analysed and any area where costs / revenues were not transacted correctly were identified. These were checked with the municipality and the required adjustments were made. The trial balance was found to represent the true picture accurately. The positive amounts refer to charges to electricity and negative amounts refer to amounts charged by electricity to the various departments and detailed in the fourth column.

Some adjustments have however been made to represent the data more accurately for tariff determination purposes as shown in Table 21.

Table 21

Sum of TOTAL									
Row Labels	HOUSING Total	SPORT RECREATION Total	COMMUNITY SOCIAL SERVICES Total	ROAD TRANSPORT Total	PUBLIC SAFETY Total	WASTE MANAGEMENT Total	WASTE WATER MANAGEMENT Total	WATER Total	ELECTRICITY Total
COST ADJUSTMENTS	-	-	-	-	-	-	3 145 887	3 145 887	-6 291 773
GENERAL EXPENSES: DEPARTMENTAL	-	-	-	-	-	-771 047	-742 984	-1 639 605	-3 594 737
INTER- DEPARTMENTAL CHARGES	-	-	-	-	-	771 047	742 984	1 639 605	3 594 737
Buk purchases for other departments							3 145 887	3 145 887	-6 291 773
REVENUE ADJUSTMENTS	3 515 230	-	1 250 000	12 686 115	137 485	-	2 650 803	21 636 244	17 773 706
Transfer from Grants: Capital	3 515 230	-	50 000	12 450 788	137 485	-	-	21 359 212	17 600 000
Capital Contribution: Fixed	-	-	-	235 327	-	-	212 320	277 032	173 706
Transfer of Grants: Capital	-	-	1 200 000	-	-	-	2 438 483	-	-
Equitable share									
Income foregove									
New Total Cost	**26 174 327**	**33 514 806**	**24 915 034**	**76 424 105**	**97 321 745**	**59 826 526**	**58 969 073**	**90 029 094**	**331 657 493**
New Total Revenue	-18 124 688	-5 560 378	-13 252 988	-26 274 320	-50 286 365	-55 424 342	-81 311 925	-103 022 688	-387 437 332
New net income	8 049 639	27 954 427	11 662 046	50 149 785	47 035 381	4 402 183	-22 342 852	-12 993 594	-55 779 839

10.3. Overhead cost allocation

The next step is to calculate the fair portion of the municipal overheads that should be covered by the electricity department. It was previously stated that no overhead costs have been allocated to Electricity. The next section does a calculation of a fair amount which should be allocated to all the line functions in the municipality by overhead and service departments. The first step is to calculate the ratios of various possible allocation factors using actual data.

Various ratios were analysed. The problem found was that in many cases the data required was inadequate in terms if not reflecting the required departments or in many cases were all grouped together. It is however believed that these ratios provide a fair means of allocating overhead costs.

The table below then shows the following:

ALLOCATER DATA.
- This refers to the various allocation bases which are to be used.
- The first line shows the data used.
- The second line shows the ratio which will be applied in allocating the service department costs to that line department.
- This is calculated by dividing the line department units by the total units of all line departments.

ALLOCATION TO LINE DEPARTMENTS
- This shows the amounts allocated from each service department to the various line departments.
- The first column shows the name of the Service department.
- The second column shows the basis for allocation of the cost. Various bases were considered and inputs from staff was obtained at the workshops. Unfortunately, only those where data was provided could be used.
- The third column shows the percentage of the service department costs to be allocated on the basis.
- The cells in yellow shows the amounts allocated from the service department as a (_).
- The other cells show the amounts allocated to each line department.
- The last column shows that the net amounts sum to zero.

NEW NET INCOME
- This shows the new costs / revenue per department after the cost allocations.
- The subsequent new net income.

The following should also be noted:

- The cost for the Councillors and admin is not allocated to line departments. This will be offset against Account surplus.
- The Municipal and General is a problematic cost centre because:
    - The majority of grant funding is collected under this account. This will not be off-set against line department costs.
    - Various very big costs which belong to line departments are also collected here. The following is proposed in this respect:
        - Only the big cost items minus the small, related incomes will be allocated to the line departments.
        - Bad debt written off. This mainly relates to rates income thus based on total line depart cost.
        - Depreciation. This is only on common assets. Total line depart cost.
        - Inventory and consumables. Total line depart cost.
        - Interest costs relating to retirement benefits. Line department labour cost.
        - Leave pay. Line department labour cost.
        - Various operational costs. Total line depart cost.
- Municipal manager. All costs allocated to Line departments based on total own costs.
- Financial services.
    - Asset and risk based on asset values.
    - Billing finance based on number of bills per service.
    - Debt collection based on outstanding debt per service.
    - Supply chain based on inventory.
    - Remainder based on total cost. Net amount minus property rates income.
- Corporate services. Total net amount.
    - All HR functions according to staff numbers.
    - Remainder based on total cost.
- Strategy and Economic development. Net amount all based on total cost.

The allocation factors and allocations to line departments are shown in

Table 22.

Table 22

Sum of TOTAL														
Row labels		HOUSING Total	SPORT RECREATION Total	COMMUNITY SOCIAL SERVICES Total	ROAD TRANSPORT Total	PUBLIC SAFETY Total	WASTE MANAGEMENT Total	WASTE WATER MANAGEMENT Total	WATER Total	ELECTRICITY Total
ALLOCATER DATA										
Allocation factors to all Line departments										
Total cost (-purchases)		26 174 327	33 514 806	24 915 034	76 424 105	97 321 745	59 826 526	58 969 073	90 029 094	42 206 098
	Ratio		7%	5%	15%	19%	12%	12%	18%	8%
SERVICE CHARGES		-	-	-	-	-	-31 878 660	-45 780 628	-83 195 598	-375 418 626
	Ratio		0%	0%	0%	0%	6%	9%	16%	70%
Arrear revenue		87 436	-	-	-	-	7 501 351	9 577 076	27 004 728	50 359 281
	Ratio		0%	0%	0%	0%	8%	10%	29%	53%
Number of customers / bills / vending		-	-	-	-	-	23 352	23 352	23 352	21 309
	Ratio		0%	0%	0%	0%	26%	26%	26%	23%
Number of meter readings /y		-	-	-	-	-	-	-	23 352	6 931
	Ratio		0%	0%	0%	0%	0%	0%	77%	23%
EMPLOYEE RELATED COSTS - SOCIAL CONTRIBUTIONS		2 384 584	23 102 123	21 313 945	28 234 971	52 257 400	21 806 048	12 639 242	22 191 710	23 156 676
	Ratio	1%	11%	10%	14%	25%	11%	6%	11%	11%
Staff numbers		6	-	33	119	112	32	32	36	38
	Ratio	1%	0%	8%	29%	27%	8%	8%	9%	9%
Infrastructure Asset values		45 196 515	1 694 197	2 428 432	1 256 192 833	7 750	39 541 751	727 530 027	918 008 284	655 031 168
	Ratio	1%	0%	0%	34%	0%	1%	20%	25%	18%
DEPRECIATION: PROPERTY, PLANT AND EQUIPMENT		1 117 258	2 832 481	1 401 867	29 477 290	1 273 404	4 919 852	15 629 413	16 260 078	14 340 302
	Ratio	1%	3%	2%	34%	1%	6%	18%	19%	16%
IT replacement values		22 336	23 118	650 789	711 621	99 089	31 948	12 022	15 618	431 379
	Ratio	1%	1%	33%	36%	5%	2%	1%	1%	22%
GENERAL EXPENSES: CONTRACTED SERVICES		-	230 400	107 014	-	786 242	8 356 296	666 432	598 233	719 160
	Ratio	0%	2%	1%	0%	7%	73%	6%	5%	6%
Capex		4 261 641	2 076 802	3 268 517	52 819 842	4 045 236	18 673 441	-	3 162 843	36 691 823
	Ratio	3%	2%	3%	42%	3%	15%	0%	3%	29%
REPAIRS AND MAINTENANCE		237 847	2 125 820	268 870	10 695 131	922 016	10 686 376	4 543 314	1 860 174	2 937 095
	Ratio	1%	6%	1%	31%	3%	31%	13%	5%	9%
Vehicle asset values		-	-	9 792 050	9 175 801	16 708 299	19 075 368	9 175 801	2 424 804	5 079 740
	Ratio	0%	0%	14%	13%	23%	27%	13%	3%	7%
ALLOCATION TO LINE DEPARTMENTS		5 265 024	6 758 200	16 169 259	35 098 566	22 191 786	19 034 309	13 069 333	18 959 183	22 696 966
Appropriation Account Total		-	-	-	-	-	-	-	-	-
EXECUTIVE COUNCIL Total		1 834 786	2 349 344	1 746 511	5 357 229	6 822 127	4 193 761	4 133 555	6 310 921	2 958 592
FINANCE ADMIN		114 451	146 548	108 945	334 176	425 554	261 600	257 851	393 665	184 552
FINANCE ADMIN		2 060	-	-	-	-	176 749	225 658	636 294	1 186 581
ASSET MANANGEMENT		212 054	271 523	201 851	619 157	788 461	484 690	477 743	729 379	341 937
BUDGET AND TREASURY OFFICE		178 421	228 459	169 837	520 956	663 408	407 817	401 972	613 697	287 704
BUDGET AND TREASURY OFFICE		-	-	-	-	-	887 478	887 478	887 478	809 836
FLEET MANAGEMENT		-	-	305 748	286 506	521 702	595 611	286 506	75 712	158 610
HUMAN RESOURCES		62 978	610 137	562 911	745 698	1 380 141	575 907	333 808	586 093	611 578
HUMAN RESOURCES		80 430	-	442 366	1 595 198	1 501 363	428 961	428 961	482 581	509 391
INTERNAL AUDIT		203 191	260 175	193 415	593 279	756 507	464 432	457 776	698 894	327 645
IT SERVICES		320 867	332 096	9 348 733	10 222 601	1 423 433	458 933	172 699	224 356	6 196 864
MUNICIPAL PROPERTY		1 574 285	2 015 786	1 498 543	4 596 615	5 853 528	3 598 335	3 546 763	5 414 903	2 538 534
OCCUPATIONAL HEALTH AND SAFETY		55 041	-	302 723	1 091 639	1 027 425	293 550	293 550	330 244	348 591
SUPPLY CHAIN MANAGEMENT		-	97 502	45 287	-	332 725	3 536 252	282 023	253 163	304 337
SUPPLY CHAIN MANAGEMENT		62 121	157 489	77 945	1 638 965	70 802	273 548	869 010	904 075	797 334
SUPPLY CHAIN MANAGEMENT		165 396	80 601	126 852	2 049 948	158 997	724 722	-	122 751	1 424 022
PLANNING DEVELOPMENT Total		373 156	181 848	286 196	4 624 967	354 207	1 635 074	-	276 943	3 212 791
TOURISM		25 789	26 692	751 396	821 632	114 407	36 886	13 881	18 032	498 067
NEW COST AFTER ALLOCATION		31 439 351	40 273 006	41 084 293	111 522 671	119 513 531	78 860 834	72 038 406	108 988 276	354 354 459
NEW REVENUE		-18 124 688	-5 560 378	-13 252 988	-26 274 320	-50 286 365	-55 424 342	-81 311 925	-103 022 688	-387 437 332
NEW NET INCOME		13 314 664	34 712 627	27 831 305	85 248 351	69 227 166	23 436 492	-9 273 519	5 965 589	-33 082 874

The actual allocations from the various departments are shown in Table 23.

Table 23

Sum of TOTAL	Column Labels									
			IE							
			Appropriation Account Total	EXECUTIVE COUNCIL Total	FINANCE ADMIN					
Row Labels			SURPLUS/(DEFICIT) FOR YEAR		ADMINISTRATION - FINANCIAL SERVICES	ASSET MANANGEMENT	BUDGET AND TREASURY OFFICE	FINANCE	FLEET MANAGEMENT	GRANTS AND SUBSIDIES FMG
ALLOCATION TO LINE DEPARTMENTS			-	-35 706 926	-2 227 343	-2 063 398	-3 472 271	-	-1 115 198	-
Appropriation Account Total		NA								
EXECUTIVE COUNCIL Total	Total cost (exc purchases)	100%		-35 706 926						
FINANCE ADMIN	Total cost (exc purchases)	50%			-1 113 671					
FINANCE ADMIN	Arrear revenue	50%			-1 113 671					
ASSET MANANGEMENT	Total cost (exc purchases)	100%				-2 063 398				
BUDGET AND TREASURY OFFICE	Total cost (exc purchases)	50%					-1 736 135			
BUDGET AND TREASURY OFFICE	Number of customers / bills / vending	50%					-1 736 135			
FLEET MANAGEMENT	Vehicle aset values	100%							-1 115 198	
HUMAN RESOURCES	Staff costs	50%								
HUMAN RESOURCES	Number of staff	50%								
INTERNAL AUDIT	Total cost (exc purchases)	100%								
IT SERVICES	It asset values	100%								
MUNICIPAL PROPERTY	Total cost (exc purchases)	100%								
OCCUPATIONAL HEALTH AND SAFETY	Number of staff	100%								
SUPPLY CHAIN MANAGEMENT	Contract services	33%								
SUPPLY CHAIN MANAGEMENT	Depreciation	33%								
SUPPLY CHAIN MANAGEMENT	Capital expenditure	33%								
PLANNING DEVELOPMENT Total	Capital expenditure	100%								
TOURISM	Total cost (exc purchases)	100%								
		100%								
NEW COST AFTER ALLOCATION			-	**413 494**	-	-	-	**43 933 611**	-	**1 550 000**
NEW REVENUE			-	**-413 494**	-	-	-	**-131 396 843**	-	**-1 550 000**
NEW NET INCOME			-	**0**	-	-	-	**-87 463 232**	-	-

							FINANCE ADMIN Total	Total	PLANNING DEVELOPMENT Total	OTHER Total
HUMAN RESOURCES	INTERNAL AUDIT	IT SERVICES	MUNICIPAL PROPERTY	OCCUPATIONAL HEALTH AND SAFETY	PROPERTY RATES	SUPPLY CHAIN MANAGEMENT		SUPPLY CHAIN MANAGEMENT		TOURISM
-5 469 250	-1 977 156	-14 350 291	-15 318 646	-1 871 381	-	-7 274 474	-55 139 408	-4 920	-10 945 181	-2 306 782
							-1 113 671			
							-1 113 671			
							-2 063 398			
							-1 736 135			
							-1 736 135			
							-1 115 198			
-2 734 625							-2 734 625			
-2 734 625							-2 734 625			
	-1 977 156						-1 977 156			
		-14 350 291					-14 350 291			
			-15 318 646				-15 318 646			
				-1 871 381			-1 871 381			
						-2 424 825	-2 424 825	-1 640		
						-2 424 825	-2 424 825	-1 640		
						-2 424 825	-2 424 825	-1 640		
									-10 945 181	
										-2 306 782
1 021 795	-	-	**1 263 470**	-	**3 183 501**	-	**50 952 377**	-	**4 945 805**	**14 839**
-1 021 795	-	-	**-1 263 470**	-	**-156 523 128**	-	**-291 755 235**	-	**-4 945 805**	**-14 839**
-	-	-	-	-	**-153 339 627**	-	**-240 802 859**	-	-	**-0**

The result of all these adjustments and allocations is that electricity go from a surplus of R67 mill to a surplus of R33 mill with overhead allocation of just over R22 mill.

The next step is to allocate the costs between the various sections within electricity. The allocation factors and the actual allocation of the various cost items to the various departments within electricity are shown in Table 24.

Table 24

	RINGFENCING WITHIN ELECTRICITY PARAMETERS	Energy	Networks MV	NetworksMV/LV	Networks LV	Custemer Services	Streetlights	Electricity Total
	Network asset values	-	160 995 380	210 132 407	147 899 711	189 910 700	34 916 104	743 854 302
	Ratio	0%	22%	28%	20%	26%	5%	100%
	Network depreciation'	-	3 577 675	5 253 310	4 225 706	15 341 403	2 327 740	30 725 835
	Ratio	0%	12%	17%	14%	50%	8%	100%
	HR numbers	0.58	2.65	3.97	17.31	16.68	4.83	46
	Ratio	1%	6%	9%	38%	36%	11%	100%
	Sub-total cost	289 458	3 896 995	5 618 179	11 507 773	17 982 970	3 712 110	43 007 486
	Ratio	1%	9%	13%	27%	42%	9%	100%

ELECTRICITY SUMMARY	Allocater	Energy	Networks MV	NetworksMV/LV	Networks LV	Custemer Services	Streetlights	Electricity Total
DEPRECIATION: PROPERTY, PLANT AND EQUIPMENT	Depreciation	-	1 669 766	2 451 815	1 972 213	7 160 110	1 086 398	14 340 302
EMPLOYEE RELATED COSTS - SOCIAL CONTRIBUTIONS	Network depreciation'	45 043	207 199	310 798	1 355 800	1 306 253	378 363	3 603 456
EMPLOYEE RELATED COSTS - WAGES SALARIES	HR numbers	244 415	1 124 310	1 686 465	7 356 899	7 088 042	2 053 088	19 553 220
GENERAL EXPENSES: BULK PURCHASES	Energy	283 159 622						283 159 622
GENERAL EXPENSES: CONTRACTED SERVICES	Network asset values	-	155 651	203 157	142 990	183 606	33 757	719 160
INTEREST EXPENSE	Network asset values	-	104 382	136 241	95 892	123 130	22 638	482 283
REPAIRS AND MAINTENANCE	Network asset values	-	635 687	829 704	583 979	749 859	137 866	2 937 095
Commission: Pre-paid Electricity						1 371 971		1 371 971
GENERAL EXPENSES: INTER DEPARTMENTAL RECOVERIES	Tot (exc Bulk)	2 081	28 011	40 382	82 716	129 258	26 682	309 130
GENERAL EXPENSES: OTHER	Tot (exc Bulk)	34 872	469 484	676 841	1 386 380	2 166 468	447 210	5 181 255
OVERHEADS	Sub-total cost	152 760	2 056 618	2 964 963	6 073 164	9 490 414	1 959 046	22 696 966
BAD DEBTS								-204 237
DONATED PROPERTY PLANT AND EQUIPMENT	-							-3 776 952
EQUITABEL SHARE		-						-6 381 133
OTHER REVENUE		-						-1 830 090
SERVICE CHARGES		-						-381 369 290
LESS REVENUE FOREGONE								5 950 665
TOTAL COSTS		283 638 793	6 451 107	9 300 366	19 050 033	29 769 111	6 145 048	354 354 459
TOTAL REVENUE								-387 611 038
NET INCOME - loss								-33 256 579

This shows a surplus of 33 mill per year.

11. REVENUE REQUIREMENT.

This section calculates the revenue requirement for Swartland using the NERSA method. The items are then grouped as per the NERSA requirements. The calculation of the revenue requirement is shown in Table 25.

Table 25

NERSA RR	Energy	Networks MV	NetworksMV/LV	Networks LV	Custemer Services	Streetlights	Electricity Total	With 7.5% surplus and 35% ROA at CRC
Bulk	283 638 793						283 638 793	283 638 793
Operating cost	-	743 580	1 100 210	4 427 845	5 660 921	1 232 604	13 165 160	26 330 319
Shared cost	152 760	2 056 618	2 964 963	6 073 164	9 490 414	1 959 046	22 696 966	45 241 171
Depreciation	-	1 669 766	2 451 815	1 972 213	7 160 110	1 086 398	14 340 302	30 725 835
Interest / ROA	-	104 382	136 241	95 892	123 130	22 638	482 283	26 034 901
Repairs and Maintance actual	-	635 687	829 704	583 979	749 859	137 866	2 937 095	5 874 190
Bad debt written off	-	-	-	-	-	-	-	-
Sub-total cost	**283 791 554**	**5 210 033**	**7 482 932**	**13 153 093**	**23 184 434**	**4 438 552**	**337 260 598**	**417 845 209**
Surplus:		-			-	15%	50 589 090	31 338 391
Total Allowed revenue		-			-	-	**387 849 687**	**449 183 600**
Adjusted revenue		-			-	-	**-387 611 038**	**-387 611 038**
Shortfall		-			-	-	**238 649**	**61 572 562**
% Structure increase		-	R/kWh	R/kWh	R/kVA	R/kVA	**0.1%**	**15.9%**

The following very important facts need to be noted:

- A surplus of 15% after allocation of overhead costs is considered high as the NERSA benchmarks (10 to 20%) were developed assuming no overhead costs.
- The calculated Head Office / Service department allocation (admin charge) to electricity is equal to 33% own costs excluding Eskom. This can be considered to be reasonable but close to the limit.

- The current replacement value (CRV) annual depreciation is equal to R38 595 966. The surplus must at least cover the amount leaving only R12 mill for rates relief. This is considered too low.
- If the CRV deprecation and return on Assets at 3.5% is used as basis for revenue requirement with a 7.5% surplus a structure increase of 15% is suggested.
- This shows that there a good case to be made for an increase above the NERSA recommended guideline as was done for the 223/2024 financial year.

12. REPRESENTATIVE LOAD PROFILE ANALYSIS.

Extensive work is required in respect of load profiles. This refers to the way electricity is used by different customer categories and through different networks. The data used is 12 months of ½ hourly data.

The representative load profiles refer to the typical load profile of customers in a tariff category. The typical profiles that have been accepted nationwide and for which data is separately available include the following:

- MV supplies
- Industry
- Municipal
- Commercial
- Domestic
- SSEG
- SSEG E
- Res Poor
- Streetlights.

The municipality provided 52 customer load profiles. Unfortunately, most of them only contained just over 3 months of data. This meant that these profiles had to be extrapolated to annual values. This meant that the seasonal pattern is lost but at least the weekly patterns could be calculated.

Details of the customers and the type of profile of each type is indicated in Table 26.

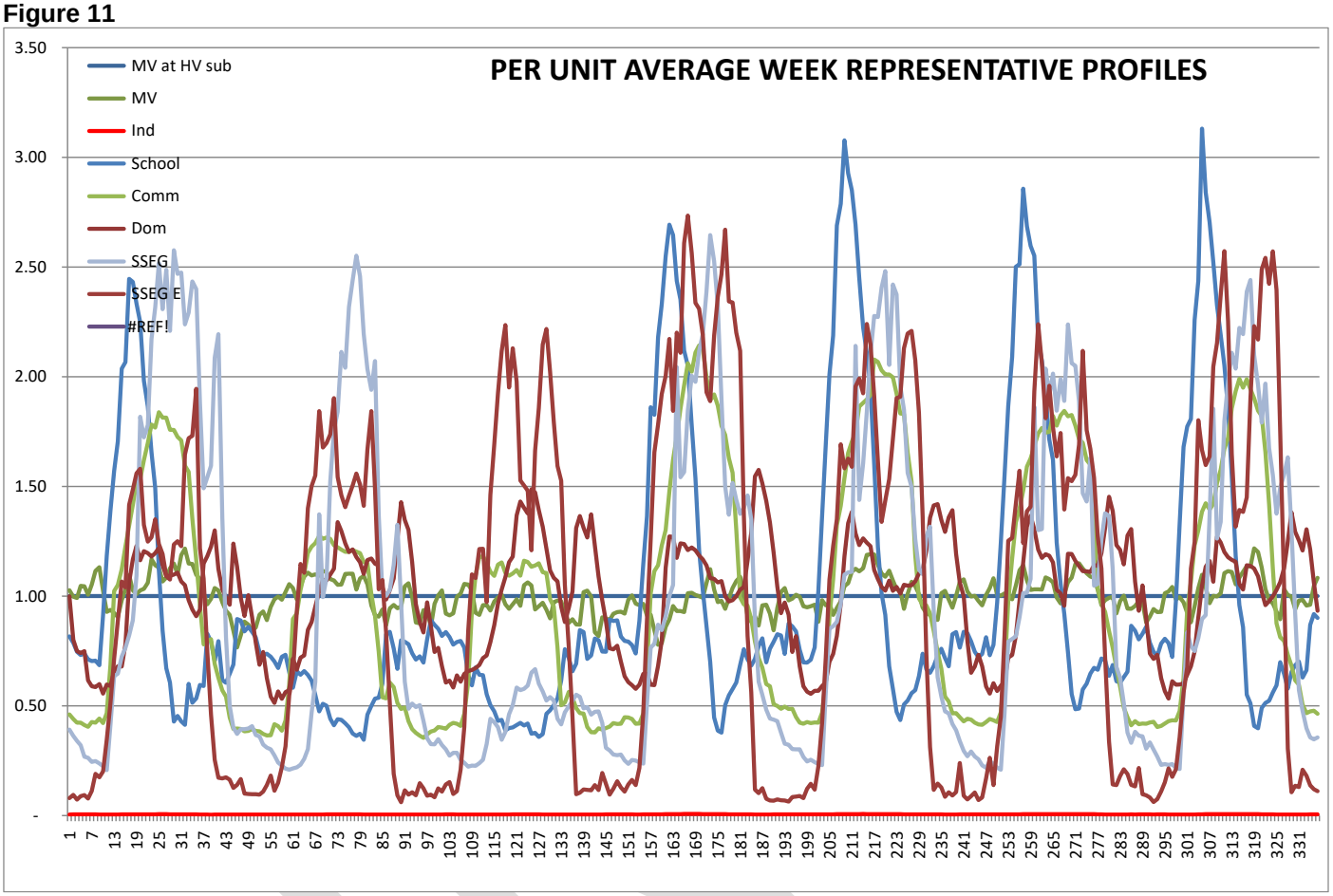
Table 26

Row Labels
Comm
Bonwitt PR-10080025 (20
Checkin PR-09090019 (2023-10-11 08h58m4
Cinsaut 22, Meter Serial: 18420006
Darling Vleis PR-11380077 (2023-10-11 09h49m0
Engen Quickshop PR-12050005 (2023-10-10 09h54m4
Kaap Agri Meganisasie PR-12200080 (2023-10-10 08h59m5
Kaap Agri PR-12330001 (2023-10-16 08h57m5
Majormatic PR-11220085 (2023-10-16 10h32m0
Pepstores PR-08350039 (2023-10-12 14h56m1
PR-11370024 (2023-10-10 11h24m0
PR-15410033 (2023-10-11 11h21m2
Raiel PR-12200066 (2023-10-12 15h21m0
Smitties Eng PR-0723010
Spar PR-08350011 (2023-10-11 15h23m2
Swartland LaerskoolPR-15410032 (2023-10-10 09h23m2
Wonderway PR-11120080 (2023-10-16 09h24m4
Dom
Fklipfontein Domestic feeder
Groenweide Outehuis PR-11220082 (2023-10-11 14h14m4
Meter Serial: 15330015
Ind
Bonwit PR-11410074 (2023-10-12 15h45m2
Cape Dutch Joinery
Cape Dutch Joinery PR-1
Curbs PR-18380007 (2023-10-16 10h52m1
Darling Brew PR-15330003 (2023-10-16 12h03m3
Finitex PR-09290004 (2023-10-12 16h23m3
HPKSentrale PR-17120020 (2023-10-10 11h55m0
Meter Serial: 11210118
Meter Serial: 14500047
PR-18420006 (2023-10-12 12h14m3
RBJ Brick & Block PR-14500048 (2023-10-16 11h51m0
Roelcor EFS PR-15320055
Roelcor Slagpale PR-064
Roelcor Verpakking
Volstruis PR-20360029 (
WPK WerkwinkelPR-18070033 (2023-10-10 10h22m5
MV
Bokomo Meule PR-11260036 (2023-10-06 TOU
Darling Romery PR-09450065 (2023-10-16 08h32m2
Intshona Melk MD
PR-11260039 PR-11260039 (2023-10-06
Swartland Boudiense MV Meter Serial: 07220002
School
Darling Laerskool PR-09010035 (2023-10-11 12h24m3
Vooruitsig Primer PR-12330014 (2023-10-16 12h38m5
SSEG
Nemesia Hotel PR-10080014 (2023-10-11 14h41m3
Tariff 11, SSEG, Fontein str 36 PR-14320035 (2023-10-11 13h50m3
Tariff 11, SSEG, Hill str 2 PR-15410033 (2023-10-11 11h21m2
Tariff 11, SSEG, Hoof str 43 PR-12280006 (2023-10-12 15h59m3
Tariff 11, SSEG, Lang str 34 PR-14500046 (2023-10-11 11h57m3
Tariff 11, SSEG, Prospect 6 PR-14110008 (2023-10-11 10h22m4
SSEG E
Tariff 11, SSEG, Fontein str 36 PR-14320035 (2023-10-11 13h50m3
Tariff 11, SSEG, Lang Str 11 PR-14110037 (2023-10-11 10h58m1
Tariff 11, SSEG, Lang str 34 PR-14500046 (2023-10-11 11h57m3
(blank)
(blank)
Grand Total

These profiles were then analysed and the resultant representative profiles calculated.

Figure 11 shows the ½ hourly kVA values (Y-axis) for the average week (7 day ½ hours per week = x-axis) for each of the representative load profiles.

Figure 11



These profiles are then used to simulate the load profiles at each of the representative networks.

12.1. Network profiles.

To be able to calculate the load on a particular network one firstly has to calculate the profile at every infeed point on the network. This is calculated by:

- Multiplying the total load for every representative load profile being fed in at that point with the representative load profile ratio to establish the total load of every profile.
- The values for every representative profile are then added together.

The next step is to calculate the loads going through every network component.

- Calculate the load being taken at the infeed point of every network by adding the losses to the load being taken from the outgoing side of that network.
- Calculate the load through each individual network by adding the load infeed at the outgoing side of that network to the load going through the next network.
- This is an integrated process starting with the last points on the networks from where loads are taken and working upwards towards the main supply point to the distributor.
- This should be done for every half hour of the year, yielding an annual half hourly profile going through every network.

The result is an annual profile at N2 (the Eskom supply point).

12.2. Profile re-conciliation.

It is essential that an assessment be made of the accuracy of the representative load profiles used. This is done by

- calculating the annual load profile from the LV network up to HV network:
- multiplying consumption at each point on the network times the per unit representative load profile at that point.
- adding up from the LV network up to the highest voltage network including losses at each point up calculations
- and comparing that with the annual purchase load profile.

Table 27below shows the maximum demand with date and time for the actual purchase profile and the N2 profile. The maximum demand occurs at a very different time of the year.

Table 27

N2 Max	N2 Max date	N2 Max
45 724.06	2023/06/13 20:30	45 551.79
∑ kVA at Peak	∑ Own Max	Max
34 652.32	60 436.78	
		1
Purchase Max	Max date	
40 297.18	2023/06/13 16:30	40 297.18
∑ kVA at Peak	∑ Own Max	
20 987.22	#DIV/0!	

Figure 12 shows the Eskom and N2 profile for the Eskom peak day. One of the challenges with this analysis relate to the Eskom load shedding which distorts all the profiles. This is clear from this graph.

Figure 12

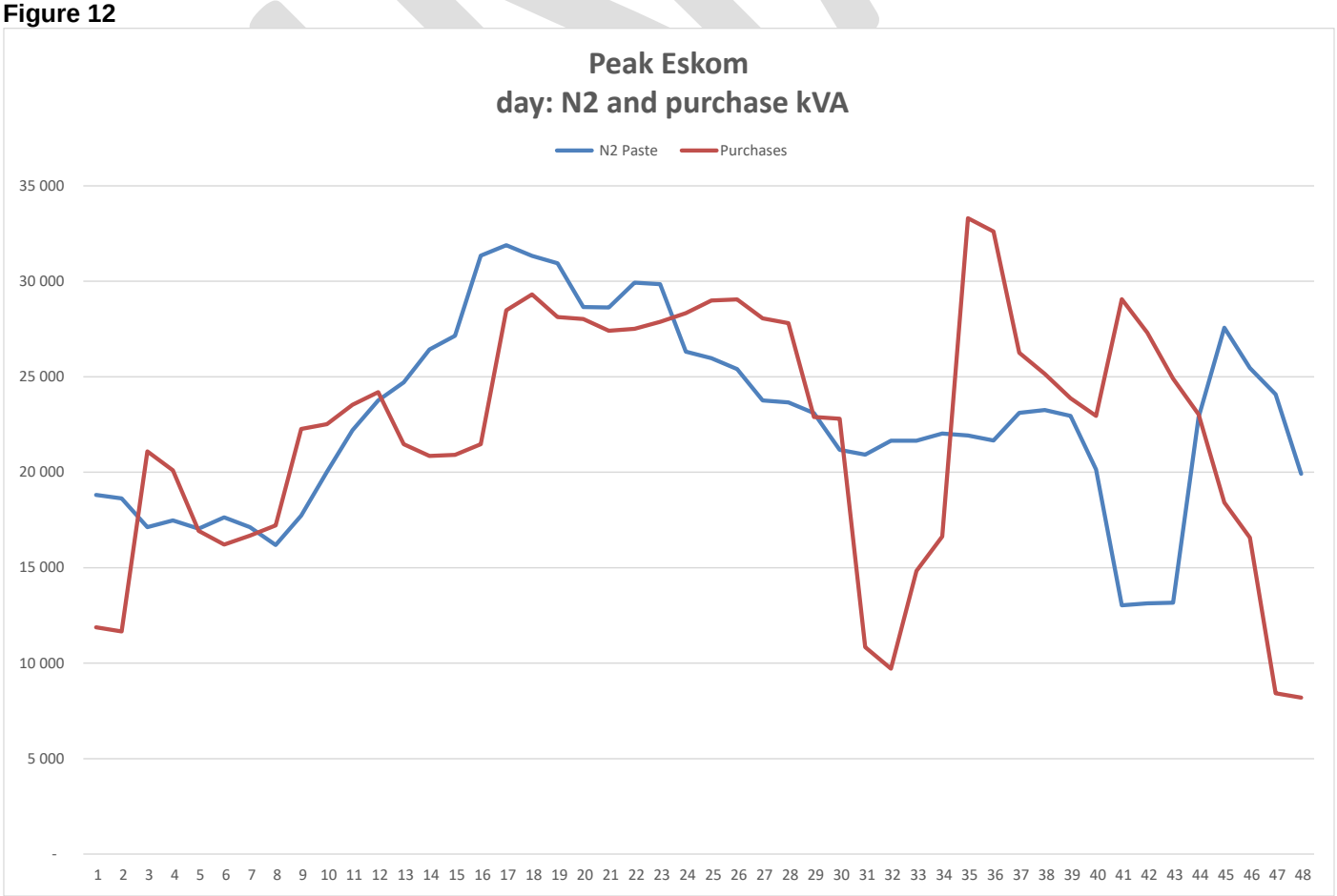


Figure 13 below shows the Eskom and N2 profile for the Eskom peak week. The same problem as for the peak day is apparent here as well.

Figure 13

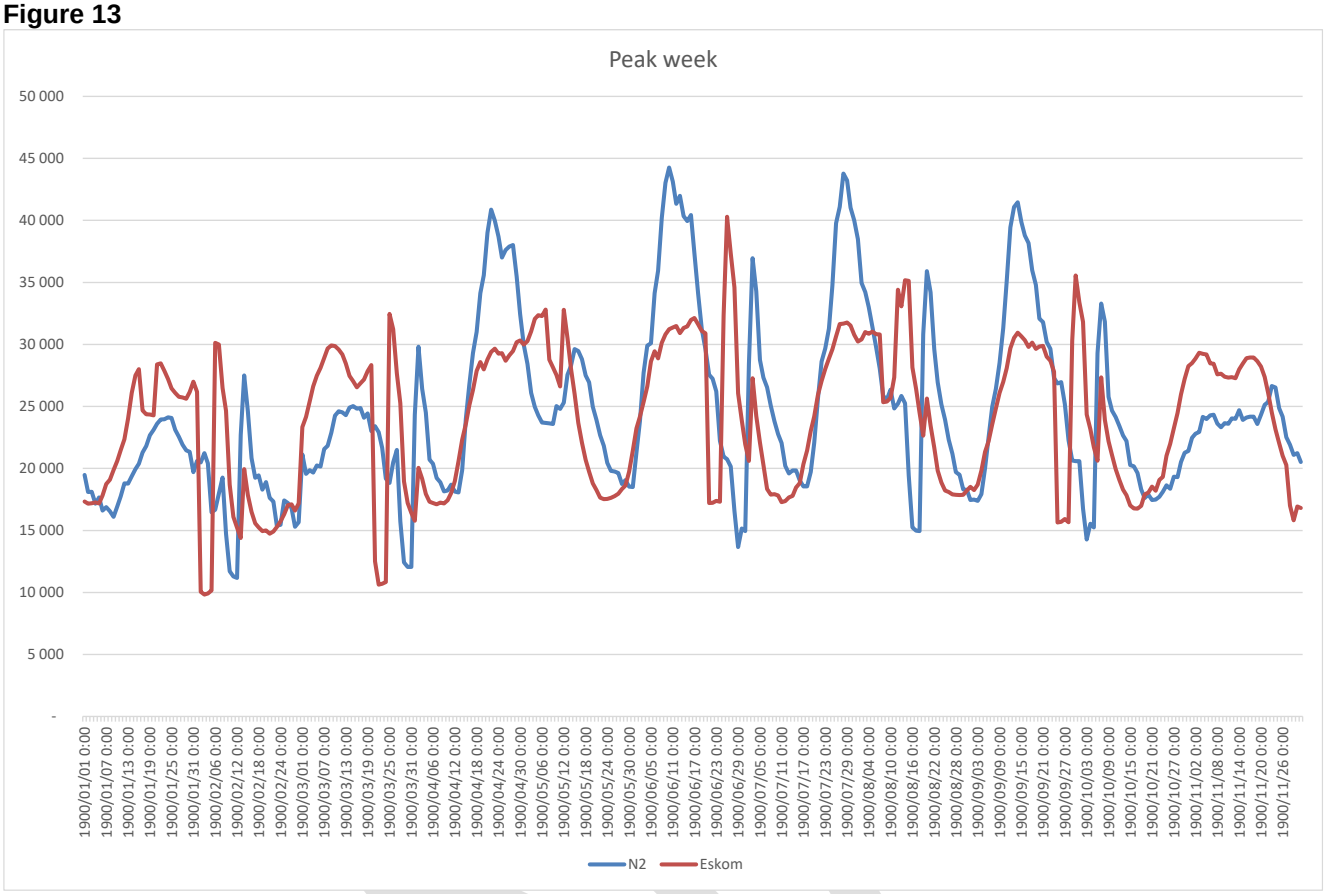


Figure 14 below shows the average week for Eskom and N2. Here it is clear that there is a very good correlation.

Figure 14

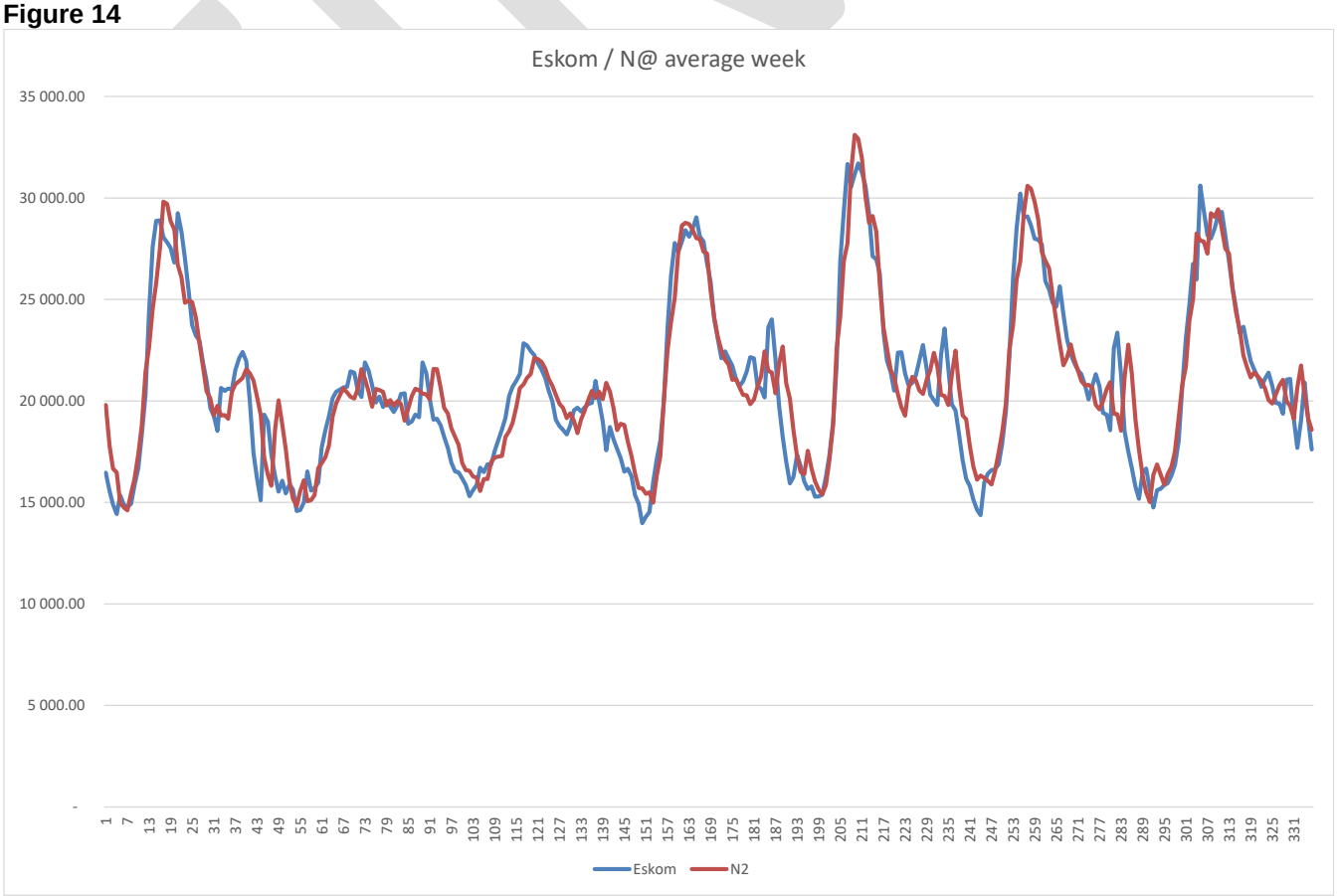


Table 28 shows a comparison of the Eskom and N2 consumption data by Eskom TOU period. Once again it is clear that there is a good correlation.

Table 28

COMPARISONS		KWH								MAX	
Supply	Grand	Low Season				High Season				DEM	
position	Total	Sub-tot	Off-peak	Standard	Peak	Sub-tot	Off-peak	Standard	Peak	Tot kWh	KVA
Bulk Purchases	178463112.5	8 792 918	21 228 881	21 322 952	48 420 702	21 363 812	51 509 134	54 245 416	129 657 793	178 078 496	421 624
Total calculated	178347256.3	8 290 310	19 863 607	20 266 786	48 420 702	22 750 752	49 934 905	56 972 136	129 657 793	178 078 496	488 451
Difference	115 856.18	(502 608.60)	(1 365 273.52)	##########	-	1 386 939.84	##########	2 726 720.02	-	-	66 827.25
% Difference	0.06%	-5.72%	-6.43%	-4.95%	0.00%	6.49%	-3.06%	5.03%	0.00%	0.00%	15.85%

This concludes the analysis of load profiles. These results will be used later on specifically as basis for the kVA units per network.

12.3. Representative Profile Quantities.

The TOU quantities for each of the representative load profiles were then calculated. The per unit representative load profile quantities for the year are then multiplied by the total kWh for each representative load profile. The results are shown in Table 29:

The process followed in the model can be described briefly as follows:

- The ½ hourly kWh and kvarh per unit figures as calculated for each annual profile from above is used as starting point. The per unit value means that each actual half hourly value is divided by the total number of half hours in a year (365 days x 24 hours = 8760).
- In other words, if the total number of kWh used by this profile of customers are multiplied by the per unit values and then again divided by 8760, the full picture for this profile is obtained.
- For each profile the kVA values are then calculated. This is done by calculating the square rout of the 1/2 hourly kWh and kvarh and multiplying by 2.
- For each half hour the excess kvarh are then calculated by obtaining the amount of kvarh exceeding the kvarh associated with the kW peak for than ½ hour with a power factor of 0.85.
- The ½ hourly kWh, kvarh and kVA figures are then sorted and summed by:
    - For each month.
    - Season: High and Low.
    - TOU period: Peak, Standard and Off-peak.
    - Excess kvarh during peak and standard periods only.
- The sum of the maximum demands incurred during each month is then calculated as well as the highest maximum demand during the whole year.
- From these the Annual Load Factor (LF) and Excess kvarh % of total kWh are calculated.
- These values are then calculated for each profile.

Table 29

REP PROFILE QUANTITIES	TOTAL				HIGH SEASON			LOW SEASON				Annual	
YEAR	ENERGY	MAX DEMAND	MAX DEMAND	MAX DEMAND P&S	Monthly KVA LOAD FACTOR	P	S	O	P	S	O	Max	kVA Load factor
PROFILE	kWh (FOR)	kW	kVA	kVA	%	kWh (FOR	kWh (FOR	kWh (FOR	kWh (FOR	kWh (FOR	kWh (FOR)	kVA	LF
1Purchases	178 463 112	413 527.62	421 623.70	421 623.70	61.07%	4.9%	4.9%	11.9%	11.9%	12.0%	28.9%	40 297	50.56%
2MV at HV sub	0	0.00	0.00	0.00	100.82%	100.0%	3.7%	9.2%	12.3%	10.7%	27.0%	0	100.00%
3MV	56 089 032	117 863.70	121 567.86	121 520.36	62.84%	3.6%	9.6%	12.0%	10.8%	27.6%	36.4%	10 955	58.45%
4Ind	32 204 943	76 040.47	82 763.68	82 763.68	57.56%	3.8%	10.2%	11.3%	11.8%	30.4%	32.4%	7 792	47.18%
5Mun	2 341 977	15 784.77	16 111.95	16 111.95	21.21%	7.4%	10.1%	11.0%	17.5%	23.9%	30.0%	1 502	17.80%
6Comm	15 414 937	55 087.91	56 931.41	56 931.41	38.44%	5.1%	15.2%	8.7%	12.2%	34.0%	24.9%	5 772	30.49%
7Dom	50 188 519	196 202.49	196 203.26	174 504.20	42.43%	4.2%	11.8%	12.0%	12.2%	27.6%	32.2%	17 186	33.34%
8SSEG	255 238	1 346.28	1 350.66	1 350.66	27.47%	4.1%	15.1%	6.1%	14.6%	41.6%	18.5%	117	24.94%
9SSEG E	0	0.00	0.00	0.00	17.92%	4.5%	10.8%	6.0%	13.7%	37.3%	27.6%	0	15.70%
10Res	21 558 716	53 641.52	54 708.85	53 691.56	60.72%	4.3%	11.2%	11.2%	12.0%	28.6%	32.8%	5 928	41.51%
11Res Poor	-	-	-	-	#DIV/0!	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!	#DIV/0!
12Lights	276 600	825.98	1 008.24	1 008.24	40.42%	1%	5%	20%	3%	11%	59%	84	37.58%

The following should be noted in this respect:

- The average Load factor refers to the total kWh per year divided by the sum of the monthly maximum demand in the year times the total hours in the year. (Total kWh for year) ÷ (Sum 12 kVA maximum demands x hours in year).
- The Annual LF refers to the total kWh per year divided by the highest maximum demand in the year times 12 times the total hours in the year. (Total kWh for year) ÷ (Highest maximum demand in year x 12 x hours in year).
- The % values in each of the TOU periods refer to the % of consumption relative to the total consumption.
- The reactive energy refers to the kvarh as calculated in the Eskom Megaflex tariff. (Sum of: kvarh – 30% of kWh for each ½ hour in peak and standard periods).

This data will be used to calculate the load demands of each profile and the kWh's used in the different time periods.

12.4. Network Profile Quantities.

The network profiles calculated above are now further processed. The maximum demand and TOU ratios are required for further analyses and the results obtained are shown in Table 30.

Table 30

NETWORK QUANTITIES	YEAR TOTAL						HIGH SEASON			LOW SEASON			YEAR TOTAL	
YEAR	P&S	ENERGY	MAX DEMAND	MAX DEMAND	MAX DEMAND P&S	Monthly KVA LOAD FACTOR	P	S	O	P	S	O	Max	kVA Load factor
Year	kvarh	kWh (FOR)	kW	kVA	kVA	%	kWh (FOR	kWh (FOR	kWh (FOR	kWh (FOR	kWh (FOR	Wh (FOR	kVA	LF
1Purchases	398 041	178 463 112	413 527.62	421 623.70	421 623.70	61.07%	4%	11%	11%	12%	29%	33%	34 305	59.34%
2N2	69 478	178 329 962	380 352.95	386 780.08	384 632.30	67.90%	4%	11%	11%	12%	29%	33%	34 305	59.34%
3Total N3	67 946	178 053 362	380 146.45	386 554.35	384 556.72	67.85%	4%	11%	11%	12%	29%	33%	34 305	59.25%
4Total N4	67 344	176 476 832	376 780.54	383 131.70	381 151.76	67.85%	4%	11%	11%	12%	29%	33%	34 001	59.25%
5Total N5	122 765	119 110 992	290 191.62	293 140.06	290 193.36	59.88%	4%	12%	11%	12%	29%	31%	26 664	50.99%
6Total N6	39 823	84 552 474	234 943.92	235 432.48	226 848.57	55.46%	4%	12%	11%	12%	29%	31%	21 145	45.65%

These values will be used to calculate the peak demands at every point on the network and thus to calculate the per unit R/kVA for each network.

13. COST OF SUPPLY

The next step is to allocate the electricity costs between the various cost functions. The table below firstly shows the cost adjustments and then the method used and the actual allocation of cost per function.
The next step is to functionalise the various costs between the various cost drivers. The 4 types of functions in electricity namely:

- Purchases
- Networks and
- Customer services.
- Streetlights.

The steps to be followed to do this are as follows:

- The costs, as per the trial balance, are firstly allocated directly to the relevant function as prescribed by the particular activity.
- The common costs are then allocated based on various relevant ratio's such as number of staff or asset values.

These calculations were already done in the Ringfencing part of the study.

13.1. Cost Classification

The next step is to classify these costs into the different cost types / drivers. The electricity costs, from a tariff point of view are classified as one of the types below:

- R/kWh in terms of the different TOU periods namely, peak, standard and off-Peak.
- R/kVA costs also separated by dedicated and shared per network.
- R/customer as per customer category.
- Rand / light in the case of streetlight maintenance costs.

The way in which these costs are functionalised / classified is shown in Table 31**.**

Table 31

COST FUNCTIONALISATION				
		R/kWh	**R/kVA**	**R/Customer**
Purchase		All Energy charges levied to munic	All demand and access charges levied to munic	None
Network costs	Capital provision	None	All	None
	Operating and maintenacne	None	All	None
Customer Services		None	None	All

The actual functionalisation/ classification of costs is shown in Table 32.

Table 32

NERSA RR	Energy	Networks MV	NetworksMV/LV	Networks LV	Custemer Services	Streetlights	Electricity Total
Bulk	283 638 793						283 638 793
Operating cost	-	743 580	1 100 210	4 427 845	5 660 921	1 232 604	13 165 160
Shared cost	152 760	2 056 618	2 964 963	6 073 164	9 490 414	1 959 046	22 696 966
Depreciation	-	1 669 766	2 451 815	1 972 213	7 160 110	1 086 398	14 340 302
Interest / ROA	-	104 382	136 241	95 892	123 130	22 638	482 283
Repairs and Maintance actual	-	635 687	829 704	583 979	749 859	137 866	2 937 095
Bad debt written off	-	-	-	-	-	-	-
Sub-total cost	**283 791 554**	**5 210 033**	**7 482 932**	**13 153 093**	**23 184 434**	**4 438 552**	**337 260 598**

The following points are of note:

- There is a small portion of customer services costs which can be classified in R/kWh. The problem is that the true cost really depends on the number of customers and not the amount of kWh purchased. All customer services costs are therefore classified as R/Customer.
- A portion of the Eskom costs relate to the demand or maximum capacity taken from the network. This will be classified as such later on in the process of detailed cost calculations.

These costs will now be used as a basis for the detailed cost calculations to follow.

13.2. Cost allocation: phase 1

The next step is to allocate the various costs per the different cost categories. This is shown in Table 33 in respect of the capital portion of the network and customer connections. It also allows for adjustment to reflect the pricing policy of the municipality. In other words, where customers pay outside of the tariff (by way of connection fees, capital contributions, subdivision fees or developer contributions), the full capital provision must not come from the tariff. In this respect staff indicated that all capital costs for new customers / capacity are covered outside of the tariff and thus no adjustment is made.

Table 33

SWARTLAND								
TOTAL NETWORK CAPITAL REVENUE REQUIREMENT								
Total Network Levilised costs			**Adjustment to reflect cash payments**		**Adjustment: difference: revenue requirement - capital provision in budget**			**Reconciled**
		R/year	%	%				R/year
Energy	Energy	0	0%	0	LEVELISATION ADJUSTMENT			0
N2	HV	0	0%	0				0
N3	HV/MV	0	0%	0	Total levelised costs		35 596 725	0
N4	MV	1 474 225	0%	1 474 225	Current capital provisi		**14 822 584**	613 872
N5	MV to LV	2 545 927	0%	2 545 927	Difference		(20 774 141)	1 060 132
N6	LV	1 816 850	0%	1 816 850	% Adjustment		41.64%	756 542
N7			0%	0				0
N8			0%	0				0
Streetights		1 151 364	0%	1 151 364				479 432
Totals		6 988 366		6 988 366				2 909 977
METERING								
1 PH kWh Pre-paid		21 242 046	0%	21 242 046				8 845 252
3 PH kWh Pre-paid		1 814 971	0%	1 814 971				755 759
1 PH kWh		3 508 974	0%	3 508 974				1 461 148
3 Ph kWh		687 333	0%	687 333				286 207
3 TOU		206 296	0%	206 296				85 902
3 PH TOU & ct's		840 427	0%	840 427				349 956
TOU RMU & CT/VT's		239 876	0%	239 876				99 885
TOU at HV sub With CB		68 435	0%	68 435				28 496
			0%	-				0
								0
								0
SUB-TOTAL		28 608 359		28 608 359				11 912 607
GRAND TOTAL		**35 596 725**		35 596 725				**14 822 584**

The next step is to allocate the support costs (operations, maintenance and administration) relating to the networks and technical customer services. The operating costs per different cost type, network and customer category are shown in Table 34.

Table 34

SWARTLAND								
OPERATING COST SEPARATION								
		Total Support costs						
Energy	N0	137 484						
Customer services	N1	15 782 199						
HV	N2	-						
HV/MV	N3	-						
MV	N4	3 554 881						
MV to LV	N5	5 103 120						
LV	N6	10 906 495						
SL	N7	3 329 515						
		38 813 693						
	Network operating	**Adjust Factorad**	**Initial ratio**	**Act Share**	**ALLOCATED SUPPORT**			
N0				0.00%	-			
N1		100%		0.00%	-			
N2		100%	0.00%	0.00%	-			
N3		100%	0.00%	0.00%	-			
N4	3554881	100%	18.17%	18.17%	3 554 881			
N5	5103120	100%	26.08%	26.08%	5 103 120			
N6	10906495	100%	55.75%	55.75%	10 906 495			
					-			
	19 564 495		100.00%	100.00%	**19 564 495**			
Customer service direct			**15 782 199**					
				Total				
	Service connection / Metering share		50.0%	**7 891 099**				
	Billing share		25.0%	**3 945 550**				
	Customer service share		25.0%	**3 945 550**				
			100.00%	15 782 199				
Service connection / Metering Revenue requirement				7 891 099				
Metering	Meter capex RR	Customers	Equivalant meter cost weight	Equivalant single phase meters	Portion of metering opex	Opex R/y	Metering: Capex and Opex	**Total R/cust/m**
1 PH kWh Pre-paid	8 845 252	13 560	1.50	20 340	54.24%	4 280 303	13 125 556	**80.7**
3 PH kWh Pre-paid	755 759	818	2.50	2 045	5.45%	430 345	1 186 104	**120.8**
1 PH kWh	1 461 148	5 989	1.50	8 984	23.96%	1 890 467	3 351 615	**46.6**
3 Ph kWh	286 207	664	2.50	1 660	4.43%	349 327	635 534	**79.8**
3 TOU	85 902	66	10.00	660	1.76%	138 889	224 791	**283.8**
3 PH TOU & ct's	349 956	243	15.00	3 645	9.72%	767 046	1 117 002	**383.1**
TOU RMU & CT/VT's	99 885	7	20.00	140	0.37%	29 461	129 347	**1 539.8**
TOU at HV sub With CB	28 496	1	25.00	25	0.07%	5 261	33 757	**2 813.1**
	-							
SUB-TOTAL	**11 912 607**	21 348	78	37 499	100.00%	**7 891 099**	**19 803 707**	
Billing/ cust.service	Equivelant cost weight	Number of customers	Equivelant < 50 kW customers	Billing/cust.serv. cost	**R/cust/m**			
				R/y				
Small <50 kVa	1	21031	21 031	7 328 345	**29.04**			
Medium <500 kVa	5	309	1 545	538 362	**145.19**			
Large <2000 kVa	10	7	70	24 392	**290.38**			
Very large >2000kVa	20	0	-	-	**#DIV/0!**			
	Total	21347	22 646	**7 891 099**				
Sub-Total							**15 782 199**	
GRAND TOTAL								**38 813 693**

The following should be noted in this respect:

- The operating costs are as per the ringfenced trial balance.
- The network costs are then allocated as follows:
  - According to the Network capital revenue requirement at first pass.
  - These figures are then adjusted based on inputs from staff to reflect the real case of support costs per network.
- The customer services costs are then split between:
  - Metering according to different connections and metering.
    - This is done by giving a weighting to each of the types of connections. The following in this respect:
      - This is a difficult number to determine because records are not kept of difference in these costs.
      - This has been done based on experiences elsewhere and inputs from staff.
      - An example is the amount of come backs that have been experienced with pre-payment meters compared with conventional 1 phase meters.

- Another example is that the Bulk meters are not read by normal meter readers but by the Distribution staff.

- The effective cost per meter is thus calculated.

- Billing and customer services according to size of customer.
  - This is again done by giving a weighting to each size of customer. The following should be noted in this respect:
    - This is one of the most difficult assumptions because records are not kept of customer service costs per size of customer.
    - This has been done based on experiences elsewhere and inputs from staff.
    - An example is that a customer > 50 kVA is a 3 phase customer which means there is a more sophisticated meter or 3 single phase meters that need to read and thus 3 readings to be entered into the billing system compared with only one for a customer < 50 kVA which are mostly 1 phase customers.
    - Staff also indicated that bigger customers have more queries on their electricity bills and they thus spend more time on them.
    - These assumptions are subjective but the best available considering the staff inputs.
  - The effective cost per size of customer is then calculated.

13.3. Cost allocation: phase 2

Swartland purchases all its energy from Eskom on TOU at Megaflex.

For these reasons the Megaflex tariff will be used as a basis to calculate the cost of supply and specifically the energy costs and unit rates.

The summary of Megaflex LG rates is shown in Table 35.

Table 35

Megaflex			2023/2024
> 900km			18.49%
≥ 500V & < 66kV	Transmission network access	R/kVA/m	R 14.72
	Network access charge:	R/kVA/m	R 28.65
	Network demand High:	R/kVA/m	R 54.32
	Network demand Low:	R/kVA/m	R 54.32
TOU: High Demand Se	Peak	c/kWh	570.46
(June -Aug)	Standard	c/kWh	172.79
	Off-peak	c/kWh	93.86
TOU: Low Demand Se	Peak	c/kWh	186.06
(Sept-May)	Standard	c/kWh	128.06
	Off-peak	c/kWh	81.21
Electrification and rural		c/kWh	13.90
Affordability		c/kWh	-
Urban low voltage subsidy charge [R/kVA/m]		R/kVA/m	R 0.00
Reliability service		c/kWh	0.71
REACTIVE ENERGY (c/	High Demand	c/kvarh	25.11
	Low demand	c/kvarh	-

These values will be used as the initial per unit energy and Demand / Access charges.

13.4. Cost allocation: phase 3

The next step is to add the capital cost to the operating costs and then allocating it to the various cost drivers as is shown in Table 36. The cost of the actual streetlights plus overheads is allocated on a per light basis.

Table 36

SWARTLAND															
CATEGORISED TOTAL COST															
ENERGY													283 728 360		
Eskom													283 590 876.30		
Capex													-		
Opex													137 484.10		
TOTAL NETWORK COSTS					ALLOCATION RATIOS								TOTAL COST		
(System peak week demand)			TOTAL		Cost	CAPEX		SUPPORT							
			CAPEX	SUPPORT	Type	Acc	MD	PODs	Demand	Units	PODs	Acc	MD	PODs	
		N0	0	0	R/y	50%	50%	0%	100%	0%	0%	0	0	0	
Energy	Energy	N1			R/y	50%	50%	0%	0%	100%	0%	0	0	0	
HV	HV	N2	0	0	R/y	50%	50%	0%	100%	0%	0%	0	0	0	
HV/MV	HV/MV	N3	0	0	R/y	50%	50%	0%	100%	0%	0%	0	0	0	
MV	MV	N4	1 567 592	3 554 881	R/y	50%	50%	0%	100%	0%	0%	2 561 236	2 561 236	0	
MV to LV	MV to LV	N5	2 689 251	5 103 120	R/y	50%	50%	0%	100%	0%	0%	3 896 185	3 896 185	0	
LV	LV	N6	1 906 345	10 906 495	R/y	50%	50%	0%	100%	0%	0%	6 406 420	6 406 420	0	
Lights	Lights	N7	1 175 671	3 329 515	R/y	0%	0%	100%	0%	0%	100%	0	0	4 505 186	
					R/y	100%	0%	0%	100%	0%	0%	0	0	0	
					R/y	100%	0%	0%	100%	0%	0%	0	0	0	
			7 338 858	**22 894 010**								**12 863 841**	**12 863 841**	**4 505 186**	
Service connection / Metering Revenue requirement															
Metering			Meter capex RR	Opex R/y										Total cost R/Y	
1 PH kWh Pre-paid			5 928 551	4 280 303										10 208 854	
3 PH kWh Pre-paid			506 549	430 345										936 895	
1 PH kWh			662 831	1 890 467										2 553 298	
3 Ph kWh			129 834	349 327										479 161	
3 TOU			38 968	138 889										177 857	
3 PH TOU & ct's			158 753	767 046										925 799	
TOU RMU & CT/VT's			45 312	29 461										74 773	
TOU at HV sub With CB			12 927	5 261										18 188	
			-	-										0	
			-	-										0	
SUB-TOTAL			**7 483 726**	**7 891 099**										**15 374 825**	
				-											
Billing/ cust.service				-											
				-										R/y	
Small <50 kVa				7 328 345										7 328 345	
Medium <500 kVa				538 362										538 362	
Large <2000 kVa				24 392										24 392	
Very large >2000kVa				-										0	
Total				**7 891 099**										**7 891 099**	
			14 822 584	**38 813 693**										**337 227 154**	

The following should be noted in this respect:

- The streetlight maintenance costs are allocated per streetlight.
- All network costs are allocated on the R/kVA basis.
- All customer costs are allocated on the R/customer/month basis.

Based on experience the non-co-incidental peak demand method was used as basis to allocate all network costs to customer categories.

The total costs have to be divided by the total number of units applicable to that cost. The units required for this purpose should be derived from the network load and customer details.

To be able to allocate the network costs as a per unit cost (R/kVA), the kVA for each network is required. This was calculated by building up the total load profile of each network starting at LV and working up to the high voltages. It must be noted that the Purchase values differ from the billing data as it is calculated from the load profile data.

The allocation units to be used are shown in Table 37**.** The network kVA and kWh quantities were obtained from the Quantities tables. The sales data was obtained from the sales data.

Table 37

SWARTLAND						
TOTAL ALLOCATION UNITS						
NETWORK						
(System peak week			Max kVA	∑kVA y	kWh	PODs
			kVA	kVA	kWh	PODs
		N0	34305	386 780	178 329 962	
Energy	Energy	N1	34305	386 780	178 329 962	
HV	HV	N2	34305	386 780	178 329 962	
HV/MV	HV/MV	N3	34305	386 554	178 053 362	
MV	MV	N4	34001	383 132	176 476 832	
MV to LV	MV to LV	N5	26664	293 140	119 110 992	
LV	LV	N6	21145	235 432	84 552 474	
Lights	LV	N6				8 603
		N5/6				
GRAND TOTAL						8 603
Metering						
Metering						
1 PH kWh Pre-paid		13 560				
3 PH kWh Pre-paid		818				
1 PH kWh		5 989				
3 Ph kWh		664				
3 TOU		66				
3 PH TOU & ct's		243				
TOU RMU & CT/VT's		7				
TOU at HV sub With CB		1				
		0				
SUB-TOTAL		21 348				
Billing/ cust.service		0				
Small <50 kVa		21 031				
Medium <500 kVa		309				
Large <2000 kVa		7				
Very large >2000kVa		0				
Total		21 347				

The next step is to calculate the unit costs. This is done by dividing the total cost per category by the relevant units. The results are shown in Table 38.

Table 38

SWARTLAND						
COST PER UNIT						
		NETWORK				
(System peak week demand)				Max kVA	∑kVA y	PODs
				All	All	R/PODs
		N0		0.00	0.00	0.00
Energy	Energy	N1		0.00	0.00	0.00
HV	HV	N2		0.00	0.00	0.00
HV/MV	HV/MV	N3		0.00	0.00	0.00
MV	MV	N4		6.28	6.69	0.00
MV to LV	MV to LV	N5		12.18	13.29	0.00
LV	LV	N6		25.25	27.21	0.00
Lights	LV	N6		25.25	27.21	43.64
GRAND TOTAL						
Metering		**R/C/m**				
1 PH kWh Pre-paid		63				
3 PH kWh Pre-paid		95				
1 PH kWh		36				
3 Ph kWh		60				
3 TOU		225				
3 PH TOU & ct's		317				
TOU RMU & CT/VT's		890				
TOU at HV sub With CB		1516				
NA		0				
AVERAGE		60				
Billing/ cust.service						
		R/C/m				
Small <50 kVa		29				
Medium <500 kVa		145				
Large <2000 kVa		290				
Very large >2000kVa		0				
NA		0				
AVERAGE		31				

The costs obtained up to now reflect the cost of every separate network segment. To have a more practical set of charges these must be set for every network supply position stating the total charges at each point. This involves the network cost closest to the supply position plus all the networks up to that point plus the losses incurred in the networks up to that point. The values stated therefore reflect the total per unit cost of supply at that network supply point. The resultant costs are shown in Table 39.

Table 39

SWARTLAND	2023/2024			Eskom adjust			0.00%
COSTS PER TARIFF COST CATEGORY				Cost increase			6.5%
				+ Surplus			15.0%

FOR ALL LOAD FACTORS

			Access	Demand	Peak	Standard	Off-peak
HIGH SEASON	Access / Demand	R/kVA/m	49.87	62.46			
	Energy	c/kWh			6.5603	1.9871	1.0793
LOW SEASON	Access / Demand	R/kVA/m	49.87	62.46			
	Energy	c/kWh			2.1397	1.4727	0.9340
	Super Peak	c/kvarh			-	-	
Fixed charges (R/m)		R/m					
Reactive energy - Hi	Total excess for year	c/kvarh	0.2887				
Transmission network		R/m					
National levies		c/kWh	0.1680				

TOTAL COSTS PER SUPPLY POSITION

			Acc %	Acc	DM		
Total Network Charges (including losses)				R/KVA/m	R/KVA/m	c/kWh	R/pod/m
		Total losses		All	All	All	
S0		0.00%				0	0.00
S1	Non-Tech	0.00%		0.00	0.00	0	0.00
S2		0.00%		0.00	0.00	0	0.00
S3		0.89%		0.00	0.00	0	0.00
S4		2.40%		7.70	8.19	0	0.00
S5		4.23%		22.71	24.58	0	0.00
S6		7.95%		53.93	58.24	0	0.00
S7 Lights		7.9%		53.93	58.24	0	43.64

Metering	**R/C/m**
1;1 PH kWh Pre-paid	76.23
2;3 PH kWh Pre-paid	115.97
3;1 PH kWh	43.17
4;3 Ph kWh	73.06
5;3 TOU	272.85
6;3 PH TOU & ct's	385.75
7;TOU RMU & CT/VT's	1081.54
8;TOU at HV sub With CB	1841.53
9;NA	0.00
10;0	0.00
AVERAGE	72.92
Billing/ cust.service	0
	R/C/m
1;Small <50 kVa	35
2;Medium <500 kVa	176
3;Large <2000 kVa	353
4;Very large >2000kVa	0
5;NA	
NA	37

The following should be noted in this respect:

- Own costs increase by CPI.
- The surplus is the actual surplus.

- The surplus reflects the current surplus which NERSA would allow under normal circumstances.
- The R/kVA costs are split here between the dedicated and shared portion as follows:
    - Dedicated refers to networks which cannot really be shared with other customers. For example, if a development is done based on a particular after diversity maximum demand (ADMD) and supplies to various small and large customers are installed, if customers change their loads the costs do not change, and these networks cannot be used to supply other customers and thus are considered dedicated.
    - Assumptions about this is subjective but also reflects the realities in each municipality. Where there is ongoing growth and customers continue to use the power installed this is not a problem.
    - In areas where economic growth is bad and customers reduce their demands, the risk of revenue loss is higher to municipalities as there are less customers to share the unused capacity with.
    - Swartland municipality felt that only 50% of the network was considered not practically sharable by other customers and thus should be recovered by way of Access charges.
- These values show the total network costs at each position on the network including the costs and losses of all higher voltage networks up to that point. In other words when a demand of say 10 kVA is incurred at a LV point of supply, the demand at the point of purchase which is increased by the total losses up to that point. Losses thus effect the network and energy costs.
- It is important to note that these are per unit values. For example, the energy costs for each profile will be calculated by using the Eskom energy rates, plus the losses up to each relevant network multiplied by the % of kWh in each TOU period multiplied by the total number of kWh for that profile.
- The Eskom and own network costs are calculated by:
    - Multiplying the sum of the monthly maximum demands by that profile by the Eskom maximum demand and own maximum demand per unit costs.
    - Multiplying the highest annual maximum demand by the Eskom access charge plus losses and the own Access costs.

Before one can go from the costs per tariff cost category to costs per tariff, we need to know the statistics of the loads associated with the various tariffs. Representative load profiles were calculated from available data. These were then analysed, and the necessary details calculated under the load profile section.

The following comments in this respect:

- The quantities shown represents the quantities associated with each representative load profile at the relevant network where it is supplied from.
- For example, the kWh represents the kWh used by streetlights supplied from the LV network. The Sum of maximum demands represents the sum of the sum of the 12 highest maximum demands incurred on the network, the Annual maximum demands is the highest maximum demand that Streetlight supplies placed on the network in the year.
- Because the individual maximum demand method is used, the maximum demand values of each profile are used irrespective of when it was incurred.
- These quantities will be used to calculate the per unit charges.

The next step is to now calculate the various per unit charges which should apply in respect of the different customer, network and energy charges relevant to the various periods. This makes use of:

- The position at which the customer is supplied to determine:
    - the R/kVA network costs plus R/kVA Eskom costs.
    - the losses % to be added to Energy and Eskom Demand/Access.
- The type of metering and size of supply to determine the metering and billing / customer service costs.

This is shown in Table 40**.**

Table 40

SWARTLAND						
yea 30/06/2023				57600		
TAR 347	2022/2023					CHARGES
TARIFF	TARIFF CODE		Network	Profile	Meter	Size	Capacity (Amps)
1	Pre-paid meter system (Indigent Residential)		S6	7Dom	1;1 PH kWh Pre-paid	1;Small <50 kVa	20
1	Households Alternative <20 Amp:-		S6	7Dom	1;1 PH kWh Pre-paid	1;Small <50 kVa	20
1	Pre-paid Meter System (Non-Indigent Residential)		S6	7Dom	3;1 PH kWh	1;Small <50 kVa	30
1	Residential Consumers (Houses, Flats & Farms) Network charge per mo		S6	7Dom	3;1 PH kWh	1;Small <50 kVa	40
1	Residential Consumers (Houses, Flats & Farms) Network charge per mo		S6	7Dom	4;3 Ph kWh	1;Small <50 kVa	30
1	Net Metering Residential (for Approved SSEG Households)		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	40
1	Commercial Pre-paid:-		S6	6Comm	1;1 PH kWh Pre-paid	1;Small <50 kVa	30
1	Commercial Alternative < 15 AMP:-		S6	6Comm	2;3 PH kWh Pre-paid	1;Small <50 kVa	20
1	Commercial Alternative < 15 AMP:-Dept		S6	6Comm	3;1 PH kWh	1;Small <50 kVa	20
1	Commerce / Non Standard (per kWh)		S6	6Comm	3;1 PH kWh	1;Small <50 kVa	60
1	Commerce / Non Standard (per kWh)-Dept		S6	6Comm	3;1 PH kWh	1;Small <50 kVa	30
1	Commerce Basic < 20KVA (Basic per month)		S6	6Comm	3;1 PH kWh	1;Small <50 kVa	30
1	Commerce Basic < 20KVA (Basic per month)-Dept		S6	6Comm	3;1 PH kWh	1;Small <50 kVa	30
1	Commerce Basic 20 to 40 KVA (Basic per month)		S6	6Comm	4;3 Ph kWh	1;Small <50 kVa	80
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept		S6	6Comm	4;3 Ph kWh	1;Small <50 kVa	60
1	Commerce Basic >40 KVA (Basic per month)		S6	6Comm	4;3 Ph kWh	1;Small <50 kVa	150
1	Commerce Basic >40 KVA (Basic per month)-Dept		S6	6Comm	4;3 Ph kWh	1;Small <50 kVa	60
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	30
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	40
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	150
1	Sports Grounds including maintenance of Floodlighting:-		S6	6Comm	4;3 Ph kWh	1;Small <50 kVa	90
1	Bulk Industrial		S5	4Ind	6;3 PH TOU & ct's	2;Medium <500 kVa	0
1	Bulk Industrial-Dept		S5	5Mun	6;3 PH TOU & ct's	2;Medium <500 kVa	0
1	Bulk Industrial mv		S4	3MV	6;3 PH TOU & ct's	3;Large <2000 kVa	0
1	Net Metering Industrial (for Approved SSEG)		S5	4Ind	6;3 PH TOU & ct's	2;Medium <500 kVa	0
1	Bulk Time Of Use Tariff: Alternative		S5	4Ind	6;3 PH TOU & ct's	2;Medium <500 kVa	0
1	Bulk Time Of Use Tariff: Alternative MV		S4	3MV	6;3 PH TOU & ct's	3;Large <2000 kVa	0
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)		S5	4Ind	6;3 PH TOU & ct's	2;Medium <500 kVa	0
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		S6	8SSEG	3;1 PH kWh	1;Small <50 kVa	0
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	0
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		S6	8SSEG	4;3 Ph kWh	1;Small <50 kVa	0
1	Streetlights - Internal Tariff		S6	9SSEG E	NA	NA	0
1	Wheeling Charges:		S6	NA	NA	NA	0
1	Availability	0	S6	7Dom	NA	NA	40

The resultant costs per tariff broken up in all the different components are shown in Table 41**.**

Table 41

SWARTLAND			CHARGES APPLICABLE FOR ALL MONTHS OF THE YEAR				HIGH SEASON CHARGES				LOW SEASON CHARGES		
yea	30/06/2023		2021/2022 TARIFF RATES				Months in year.		3.000		Months in year.		9.000
TAR	347	Cust	Basic	Access	MD (aLL hours)	ALL Energy	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	Energy Peak	Energy Standard	Energy Off-Peak
TARIFF	TARIFF CODE	R/cu	R/POS/m	R/kVA/m	R/kVA/m	R/ kWh	c/kWh	c/kWh	c/kWh	c/kvarh	c/kWh	c/kWh	c/kWh
1	Pre-paid meter system (Indigent Residential)		96.739	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Households Alternative <20 Amp:-		96.739	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Pre-paid Meter System (Non-Indigent Residential)		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Residential Consumers (Houses, Flats & Farms) Network charge p		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Residential Consumers (Houses, Flats & Farms) Network charge p		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering Residential (for Approved SSEG Households)		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commercial Pre-paid:-		96.739	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commercial Alternative < 15 AMP:-		131.215	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commercial Alternative < 15 AMP:-Dept		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce / Non Standard (per kWh)		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce / Non Standard (per kWh)-Dept		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic < 20KVA (Basic per month)		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic < 20KVA (Basic per month)-Dept		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic 20 to 40 KVA (Basic per month)		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic >40 KVA (Basic per month)		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Commerce Basic >40 KVA (Basic per month)-Dept		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Sports Grounds including maintenance of Floodlighting:-		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Bulk Industrial		487.698	65.630	78.709	0.175	6.837	2.071	1.125	0.2511	2.230	1.535	0.973
1	Bulk Industrial-Dept		487.698	65.630	78.709	0.175	6.837	2.071	1.125	0.2511	2.230	1.535	0.973
1	Bulk Industrial mv		640.739	51.139	62.768	0.172	6.717	2.035	1.105	0.2511	2.191	1.508	0.956
1	Net Metering Industrial (for Approved SSEG)		487.698	65.630	78.709	0.175	6.837	2.071	1.125	0.2511	2.230	1.535	0.973
1	Bulk Time Of Use Tariff: Alternative		487.698	65.630	78.709	0.175	6.837	2.071	1.125	0.2511	2.230	1.535	0.973
1	Bulk Time Of Use Tariff: Alternative MV		640.739	51.139	62.768	0.172	6.717	2.035	1.105	0.2511	2.191	1.508	0.956
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)		487.698	65.630	78.709	0.175	6.837	2.071	1.125	0.2511	2.230	1.535	0.973
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		68.057	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		93.996	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Streetlights - Internal Tariff		43.640	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Wheeling Charges:		-	97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008
1	Availability			97.217	113.037	0.181	7.082	2.145	1.165	0.2511	2.310	1.590	1.008

The consumption values of the various customer categories were previously calculated is shown in **Error! Reference source not found.**. These quantities are broken up into the detailed cost categories and not billing quantities. This is done by using the representative load profile, load factor and consumption per TOU period.

- The ratio of consumption Peak, Standard, Off-peak
- and the load factors of the different representative load profiles
- are obtained from the representative load profile quantities.

The following should be noted in this respect:

- The kVA for small customers represents the total maximum kVA placed on the network and not the actual installed capacity of customers. The peak values are calculated from the representative load profile quantities. This corresponds to using the individual maximum demand method for allocating network costs. If the average and access method was used, these values would be slightly different.
- The subsidised quantities: Basic and Free Basic Electricity (FBE) quantities are removed as we calculate costs.
- These quantities have been adjusted so that the same revenue as before is generated.

Error! Reference source not found. shows the calculation of the total cost per tariff. It multiplies the per unit costs by the number of units to obtain total revenue.

Table 42

SWARTLAND		QUANTITI	QUANTITIES CHARGEBLE FOR ALL MONTHS OF THE YEAR				HIGH SEASON QUANTITIES				LOW SEASON QUANTITIES			
CONSUMPTION		Number	Number of POD's	Highest MD in year	Σ MDs all hours / 12	ALL Energy	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy
TARIFF NAM	TARIFF CODE	Custo	POD's	kVA	kVA	kWh	kWh	kWh	kWh	kvarh	kWh	kWh	kWh	kvarh
1	Pre-paid meter system (Indigent Residential)		6 224	6 410	60 435	18 717 404	779 219	2 213 514	2 244 211	111	2 277 757	5 172 353	6 030 350	3 239
1	Households Alternative <20 Amp:-		360	429	4 048	1 253 743	52 194	148 267	150 323	3	152 570	346 458	403 929	3 239
1	Pre-paid Meter System (Non-Indigent Residential)		6 976	7 281	68 652	21 262 209	885 161	2 514 462	2 549 332	47	2 587 440	5 875 582	6 850 232	1 372
1	Residential Consumers (Houses, Flats & Farms) Network charge p		5 561	8 640	81 465	25 230 462	1 050 363	2 983 747	3 025 125	56	3 070 344	6 972 166	8 128 718	1 629
1	Residential Consumers (Houses, Flats & Farms) Network charge p		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering Residential (for Approved SSEG Households)		66	108	1 179	236 443	9 777	35 601	14 450	53	34 494	98 368	43 753	211
1	Commercial Pre-paid:-		818	1 663	15 822	4 440 326	226 050	673 838	386 142	10 828	539 920	1 508 519	1 105 858	39 160
1	Commercial Alternative < 15 AMP:-		227	120	1 144	320 947	16 339	48 705	27 910	783	39 025	109 036	79 931	2 831
1	Commercial Alternative < 15 AMP:-Dept		5	7	67	18 782	956	2 850	1 633	46	2 284	6 381	4 678	166
1	Commerce / Non Standard (per kWh)		116	519	4 942	1 387 000	70 610	210 483	120 617	3 382	168 652	471 208	345 431	12 232
1	Commerce / Non Standard (per kWh)-Dept		8	15	147	41 325	2 104	6 271	3 594	101	5 025	14 039	10 292	364
1	Commerce Basic < 20KVA (Basic per month)		176	259	2 464	691 548	35 206	104 945	60 139	1 686	84 088	234 941	172 229	6 099
1	Commerce Basic < 20KVA (Basic per month)-Dept		20	20	194	54 424	2 771	8 259	4 733	133	6 618	18 490	13 554	480
1	Commerce Basic 20 to 40 KVA (Basic per month)		157	799	7 606	2 134 707	108 674	323 951	185 639	5 206	259 569	725 227	531 646	18 827
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept		27	62	588	164 988	8 399	25 038	14 348	402	20 062	56 052	41 090	1 455
1	Commerce Basic >40 KVA (Basic per month)		240	1 987	18 904	5 305 264	270 082	805 096	461 359	12 938	645 091	1 802 365	1 321 270	46 788
1	Commerce Basic >40 KVA (Basic per month)-Dept		18	45	426	119 561	6 087	18 144	10 397	292	14 538	40 619	29 777	1 054
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Sports Grounds including maintenance of Floodlighting:-		22	0	0	106	5	16	9	0	13	36	26	1
1	Bulk Industrial		144	5 809	49 793	27 015 513	1 035 556	2 761 471	3 064 887	375 289	3 198 171	8 208 271	8 747 158	1 032 884
1	Bulk Industrial-Dept		22	1 331	11 411	1 833 698	135 323	185 731	201 981	15 036	321 547	438 263	550 853	66 202
1	Bulk Industrial mv		4	10 216	87 564	39 078 972	1 396 270	3 744 780	4 697 996	8 282	4 222 699	10 775 577	14 241 649	139 517
1	Net Metering Industrial (for Approved SSEG)		-	-	-	-	-	-	-	-	-	-	-	-
1	Bulk Time Of Use Tariff: Alternative		19	2 112	18 105	3 883 928	168 826	476 164	420 935	53 954	438 788	1 261 670	1 117 545	148 494
1	Bulk Time Of Use Tariff: Alternative MV		3	6 425	55 068	15 697 865	682 353	1 924 535	1 701 315	3 327	1 773 471	5 099 353	4 516 838	56 043
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month		-	-	-	-	-	-	-	-	-	-	-	-
1	Streetlights - Internal Tariff		8 603	186	1 959	256 232	11 430	27 766	15 457	286	35 171	95 590	70 818	385
1	Wheeling Charges:		-			-	-	-	-		-	-	-	
1	Availability		1 429	3 984	-	-	-	-	-	-	-	-	-	-
1	0													
1	Total:	-	31 245	58 428	491 982	169 145 445	6 953 755	19 243 634	19 362 531	492 239	19 897 336	49 330 562	54 357 627	1 582 674

Table 43

SWARTLAND		VENUE	REVENUES FROM CHARGES APPLICABLE FOR ALL MONTHS OF THE YEAR				HIGH SEASON REVENUES				LOW SEASON REVENUES			
TOTAL COSTS		Custo	Basic	Access	MD (aLL hours)	ALL Energy	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy
TARIFF NAM	TARIFF CODE	R/year	R/year	R/year	R/year	R/year	Rand /season	Rand /season	Rand /season	Rand /season	Rand /season	Rand /season	Rand /season	Rand /season
1	Pre-paid meter system (Indigent Residential)	-	6 982 039	7 225 603	6 601 430	3 394 753	5 518 248	4 748 196	2 614 828	28	5 261 257	8 223 049	6 079 754	-
1	Households Alternative <20 Amp:-	-	403 845	483 991	442 182	227 390	369 627	318 047	175 148	1	352 413	550 802	407 239	-
1	Pre-paid Meter System (Non-Indigent Residential)	-	5 505 381	8 207 990	7 498 956	3 856 301	6 268 505	5 393 758	2 970 338	12	5 976 574	9 341 049	6 906 353	-
1	Residential Consumers (Houses, Flats & Farms) Network charg	-	4 388 679	9 739 881	8 898 516	4 576 018	7 438 422	6 400 417	3 524 704	14	7 092 006	11 084 407	8 195 314	-
1	Residential Consumers (Houses, Flats & Farms) Network charg	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering Residential (for Approved SSEG Households)	-	71 938	122 008	128 788	42 883	69 241	76 368	16 836	13	79 675	156 387	44 111	-
1	Commercial Pre-paid:-	-	917 627	1 874 331	1 728 253	805 336	1 600 830	1 445 446	449 910	2 719	1 247 128	2 398 256	1 114 918	-
1	Commercial Alternative < 15 AMP:-	-	345 397	135 477	124 918	58 210	115 708	104 477	32 520	197	90 143	173 346	80 586	-
1	Commercial Alternative < 15 AMP:-Dept	-	3 946	7 928	7 310	3 406	6 771	6 114	1 903	12	5 275	10 144	4 716	-
1	Commerce / Non Standard (per kWh)	-	91 546	585 475	539 845	251 559	500 043	451 506	140 536	849	389 559	749 130	348 261	-
1	Commerce / Non Standard (per kWh)-Dept	-	6 314	17 444	16 084	7 495	14 899	13 452	4 187	25	11 607	22 320	10 376	-
1	Commerce Basic < 20KVA (Basic per month)	-	138 897	291 913	269 163	125 425	249 317	225 118	70 070	423	194 231	373 511	173 640	-
1	Commerce Basic < 20KVA (Basic per month)-Dept	-	15 784	22 973	21 183	9 871	19 621	17 716	5 514	33	15 286	29 395	13 665	-
1	Commerce Basic 20 to 40 KVA (Basic per month)	-	171 126	901 093	830 866	387 169	769 606	694 905	216 296	1 307	599 563	1 152 972	536 002	-
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	-	29 429	69 644	64 216	29 924	59 482	53 708	16 717	101	46 339	89 111	41 427	-
1	Commerce Basic >40 KVA (Basic per month)	-	261 594	2 239 435	2 064 902	962 209	1 912 658	1 727 007	537 549	3 248	1 490 058	2 865 416	1 332 095	-
1	Commerce Basic >40 KVA (Basic per month)-Dept	-	19 620	50 469	46 535	21 685	43 104	38 920	12 114	73	33 580	64 576	30 021	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Sports Grounds including maintenance of Floodlighting:-	-	23 979	45	41	19	38	35	11	0	30	57	27	-
1	Bulk Industrial	-	814 371	4 420 993	3 787 170	4 730 725	7 080 550	5 719 245	3 447 830	94 228	7 132 401	12 599 360	8 514 566	-
1	Bulk Industrial-Dept	-	124 418	1 013 158	867 905	321 102	925 265	384 664	227 218	3 775	717 099	672 715	536 206	-
1	Bulk Industrial mv	-	29 720	6 058 070	5 311 173	6 723 056	9 379 339	7 619 626	5 192 221	2 079	9 251 951	16 249 740	13 619 618	-
1	Net Metering Industrial (for Approved SSEG)	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Bulk Time Of Use Tariff: Alternative	-	107 452	1 607 542	1 377 074	680 120	1 154 340	986 177	473 529	13 547	978 563	1 936 611	1 087 829	-
1	Bulk Time Of Use Tariff: Alternative MV	-	22 290	3 809 831	3 340 119	2 700 625	4 583 657	3 915 915	1 880 292	835	3 885 682	7 689 904	4 319 557	-
1	Net Metering Time of Use Bulk Consumers (for Approved SSE	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Streetlights - Internal Tariff	-	4 505 186	210 063	213 972	46 472	80 943	59 560	18 009	72	81 240	151 970	71 399	-
1	Wheeling Charges:	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Availability	-	-	4 491 821	-	-	-	-	-	-	-	-	-	-
1	0	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Total.	-	24 980 578	53 587 178	44 180 603	29 961 753	48 160 215	40 400 379	22 028 283	123 591	44 931 658	76 584 228	53 467 679	-

The following very important point must be noted:

- In the sales analysis it was shown that the calculated revenue using the sales data and tariff data does not exactly achieve the revenue as indicated in the trial balance.
- This is because of inaccurate data provided because of various reasons including journals made in Rand values but not is sales volumes.
- The target sales revenue will thus not be that in the trial balance but that calculated from current tariffs plus adjustments.
- The adjustments are to ad back the income foregone from FBE.

The target revenue from the new cost reflective tariffs is shown in Table 44.Table 46Table 44

TARGET REVENUE		2023/2024
Previously calculated revenue		428 466 906
Plus Income foregone 2022/2023		4 916 250
Plus add internal sales		
Plus addisional streetlight revenue		5 022 987
Total		**438 406 144**

The adjustments that were made to the per unit costs are shown in Table 45

Table 45

Basic adjust	**Cap/MD djust**	**kWh adjust**
-16.17%	-16.17%	0.00%

The expanded summary data is shown in Table 46**.**

Table 46

SWARTLAND

TOTAL COSTS		TOTAL	REFERENCE	OVERCHARGE	% Overcharge
TARIFF NAM	TARIFF CODE	COST	TARIFF REVENUE	RAND	+% of Tariff
1	Pre-paid meter system (Indigent Residential)	56 649 186	29 615 493	-27 033 692	-91.3%
1	Households Alternative <20 Amp:-	3 730 685	3 177 179	-553 506	-17.4%
1	Pre-paid Meter System (Non-Indigent Residential)	61 925 216	63 919 063	1 993 847	3.1%
1	Residential Consumers (Houses, Flats & Farms) Network charg	71 338 379	86 265 699	14 927 321	17.3%
1	Residential Consumers (Houses, Flats & Farms) Network charg	-	-	-	#DIV/0!
1	Net Metering Residential (for Approved SSEG Households)	808 249	920 475	112 226	12.2%
1	Commercial Pre-paid:-	13 584 755	15 840 417	2 255 662	14.2%
1	Commercial Alternative < 15 AMP:-	1 260 978	1 144 946	-116 031	-10.1%
1	Commercial Alternative < 15 AMP:-Dept	57 527	67 003	9 477	14.1%
1	Commerce / Non Standard (per kWh)	4 048 308	3 994 336	-53 972	-1.4%
1	Commerce / Non Standard (per kWh)-Dept	124 204	120 353	-3 851	-3.2%
1	Commerce Basic < 20KVA (Basic per month)	2 111 708	3 555 275	1 443 566	40.6%
1	Commerce Basic < 20KVA (Basic per month)-Dept	171 042	339 419	168 377	49.6%
1	Commerce Basic 20 to 40 KVA (Basic per month)	6 260 905	7 709 107	1 448 201	18.8%
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	500 099	785 424	285 325	36.3%
1	Commerce Basic >40 KVA (Basic per month)	15 396 172	19 769 146	4 372 974	22.1%
1	Commerce Basic >40 KVA (Basic per month)-Dept	360 697	738 617	377 920	51.2%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	0.0%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	0.0%
1	Sports Grounds including maintenance of Floodlighting:-	24 282	561	-23 721	
1	Bulk Industrial	58 341 440	53 036 074	-5 305 366	-10.0%
1	Bulk Industrial-Dept	5 793 525	7 315 284	1 521 760	20.8%
1	Bulk Industrial mv	79 436 594	77 899 064	-1 537 530	-2.0%
1	Net Metering Industrial (for Approved SSEG)	-	-	-	0.0%
1	Bulk Time Of Use Tariff: Alternative	10 402 783	11 001 518	598 735	5.4%
1	Bulk Time Of Use Tariff: Alternative MV	36 148 706	37 389 029	1 240 323	3.3%
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)		-		0.0%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	0.0%
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	0.0%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	0.0%
1	Streetlights - Internal Tariff	5 438 886	433 296	-5 005 590	
1	Wheeling Charges:	-	-	-	0.0%
1	Availability	4 491 821	3 430 130	-1 061 691	-31.0%
1	0	-	-	-	0.0%
1	Total	438 406 144	428 466 906	-9 939 238	

The results are illustrated below in **Figure 15** in % of cost and in **Figure 16** in Rand difference between cost and current revenue. The vertical axis refers to % over or under recovery and the horizontal axis refer to the tariff.

Figure 15

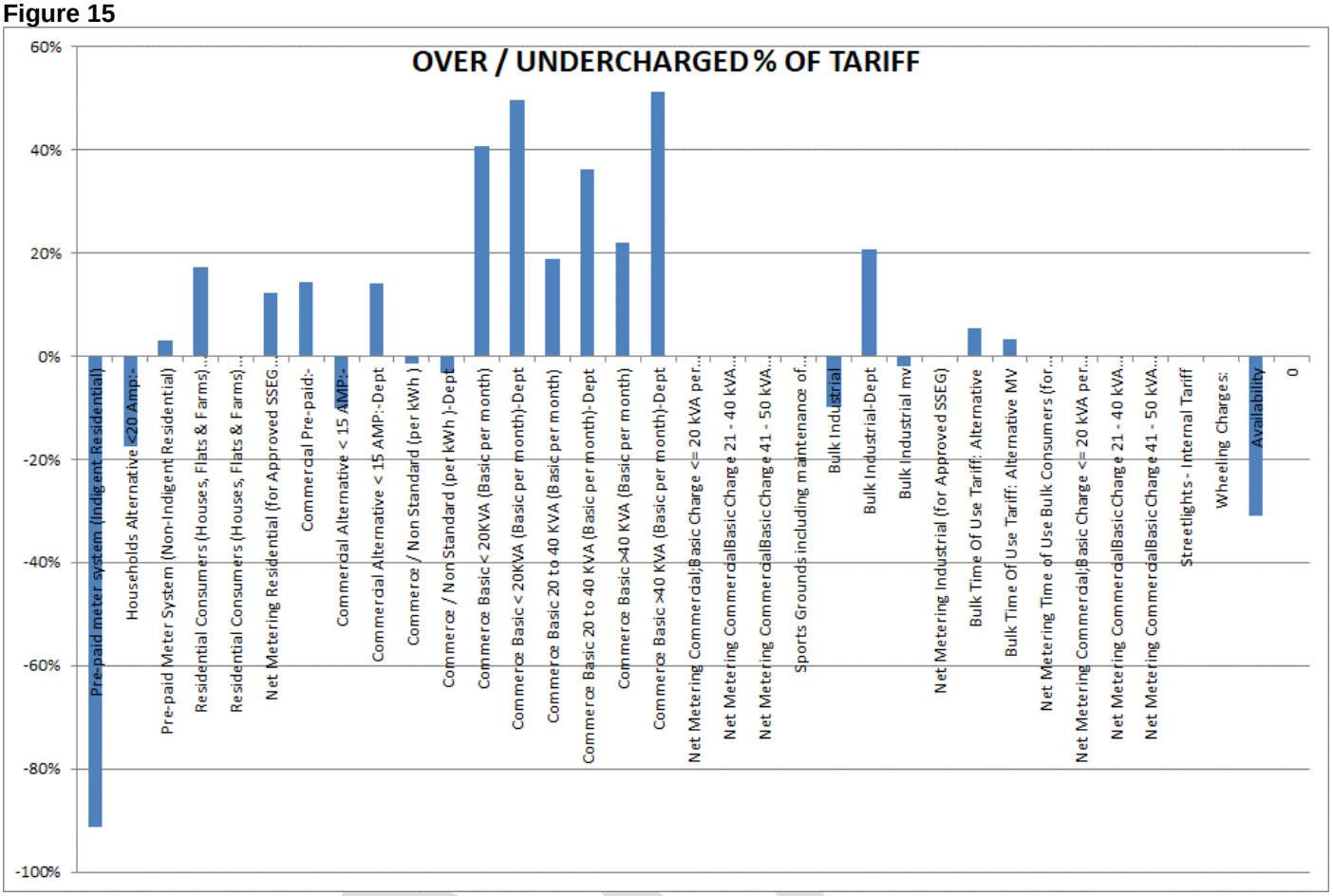
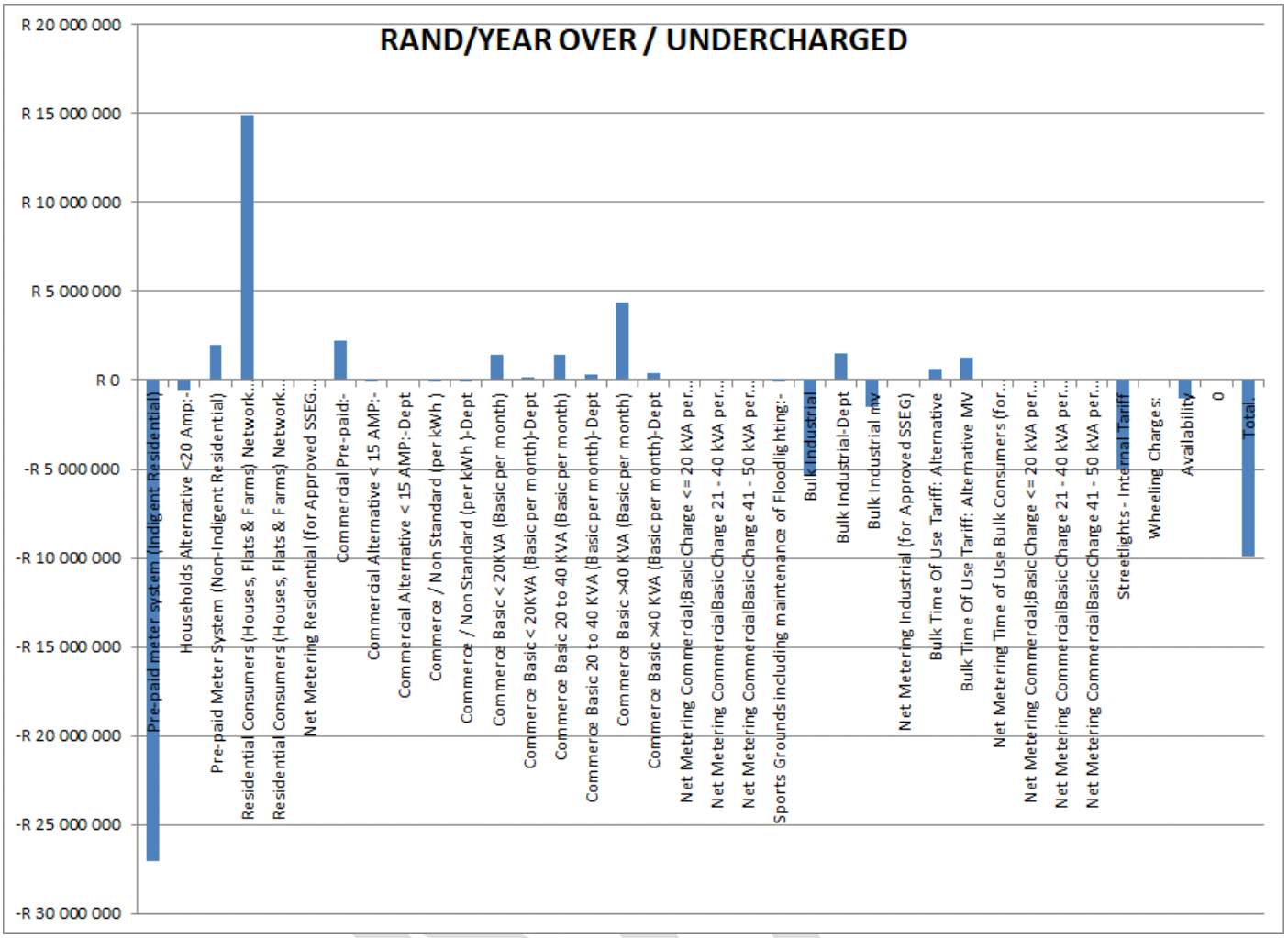


Figure 16


RAND/YEAR OVER / UNDERCHARGED
R 20 000 000
R 15 000 000
R 10 000 000
R 5 000 000
R 0
-R 5 000 000
-R 10 000 000
-R 15 000 000
-R 20 000 000
-R 25 000 000
-R 30 000 000
Pre-paid meter system (Indigent Residential)
Households Alternative <20 Amp:-
Pre-paid Meter System (Non-Indigent Residential)
Residential Consumers (Houses, Flats & Farms) Network...
Residential Consumers (Houses, Flats & Farms) Network...
Net Metering Residential (for Approved SSEG...
Commercial Pre-paid:-
Commercial Alternative < 15 AMP:-
Commercial Alternative < 15 AMP:-Dept
Commerce / Non Standard (per kWh)
Commerce / Non Standard (per kWh)-Dept
Commerce Basic < 20KVA (Basic per month)
Commerce Basic < 20KVA (Basic per month)-Dept
Commerce Basic 20 to 40 KVA (Basic per month)
Commerce Basic 20 to 40 KVA (Basic per month)-Dept
Commerce Basic >40 KVA (Basic per month)
Commerce Basic >40 KVA (Basic per month)-Dept
Net Metering Commercial;Basic Charge <= 20 kVA per...
Net Metering CommercialBasic Charge 21 - 40 kVA per...
Net Metering CommercialBasic Charge 41 - 50 kVA per...
Sports Grounds including maintenance of Floodlighting:-
Bulk Industrial
Bulk Industrial-Dept
Bulk Industrial nkv
Net Metering Industrial (for Approved SSEG)
Bulk Time Of Use Tariff: Alternative
Bulk Time Of Use Tariff: Alternative MV
Net Metering Time of Use Bulk Consumers (for...
Net Metering Commercial;Basic Charge <= 20 kVA per...
Net Metering CommercialBasic Charge 21 - 40 kVA per...
Net Metering CommercialBasic Charge 41 - 50 kVA per...
Streetlights - Internal Tariff
Wheeling Charges:
Availability
0
Total

13.5. Tariff structure analysis

The cost of supply analysis shows the total cost vs revenue impact of the various tariffs. This section compares the current tariff components with the costs for the same tariff components. This is illustrated in Table 47**.**

Table 47

SWARTLAND

TARIFF SIMPLIFICATION — 2023/2024 TARIFFS — SIMPLIFIED COSTS 2023/2024 — 18.5%

TARIFF CHARGES

Nr	TARIFF NAME	Basic	Access	MD (aLL hours)	ALL Energy	Block 1 kWh	Block 2 kWh	Block 3 kWh	Block 4 kWh	Basic	Access	Demand	kWh All
		R/POS/m	R/kVA/m	R/kVA/m	R/ kWh	50.00	350.00	600.00	>600	R/month	R/kVA	R/kVA	R/kWh
1	Pre-paid meter system (Indigent Residential)	-	-	-	-	-	1.93	2.75	3.30				3.586
1	Households Alternative <20 Amp:-	-	-	-	-	1.47	1.93	2.75	3.30				3.526
1	Pre-paid Meter System (Non-Indigent Residential)	-	-	-	-	3.01	3.27	-	-				3.451
1	Residential Consumers (Houses, Flats & Farms) Network charge per month	317.68	-	-	-	1.60	2.06	2.90	3.41		409		2.269
1	Residential Consumers (Houses, Flats & Farms) Network charge per month	317.68	-	-	-	1.60	2.06	2.90	3.41	#DIV/0!			#DIV/0!
1	Net Metering Residential (for Approved SSEG Households)	347.68	-	-	-	2.43	3.41	-	-		483		2.433
1	Commercial Pre-paid:-	-	-	-	3.57	-	-	-	-				3.625
1	Commercial Alternative < 15 AMP:-	-	-	-	3.57	-	-	-	-				4.655
1	Commercial Alternative < 15 AMP:-Dept	-	14.91	-	2.67	-	-	-	-				3.629
1	Commerce / Non Standard (per kWh)	-	14.91	-	2.67	-	-	-	-				3.458
1	Commerce / Non Standard (per kWh)-Dept	808.03	-	-	2.67	-	-	-	-		393		3.561
1	Commerce Basic < 20KVA (Basic per month)	808.03	-	-	2.67	-	-	-	-		296		2.419
1	Commerce Basic < 20KVA (Basic per month)-Dept	1 062.84	-	-	2.67	-	-	-	-		1 197		2.419
1	Commerce Basic 20 to 40 kVA (Basic per month)	1 062.84	-	-	2.67	-	-	-	-		597		2.419
1	Commerce Basic 20 to 40 kVA (Basic per month)-Dept	1 939.79	-	-	2.67	-	-	-	-		1 879		2.419
1	Commerce Basic >40 KVA (Basic per month)-Dept	1 939.79	-	-	2.67	-	-	-	-		640		2.419
1	Net Metering Commercial:Basic Charge <= 20 kVA per month	838.03	-	-	2.67	-	-	-	-0.77	#DIV/0!			#DIV/0!
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	2.67	-	-	-	-0.77	#DIV/0!			#DIV/0!
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	2.67	-	-	-	-0.77	#DIV/0!			#DIV/0!
1	Sports Grounds including maintenance of Floodlighting:-	-	-	-	5.29	-	-	-	-				271.430
1	Bulk Industrial	2 196.13	-	422.50	1.04	-	-	-	-		558	195.327	2.163
1	Bulk Industrial:Dept	2 196.13	-	422.50	1.04	-	-	-	-		558	195.327	2.448
1	Bulk Industrial:mv	2 196.13	-	422.50	1.04	-	-	-	-		734	153.847	2.063
1	Net Metering Industrial (for Approved SSEG)	2 226.13	-	422.50	1.04	-	-	-	-0.77	#DIV/0!		#DIV/0!	#DIV/0!
1	Bulk Time Of Use Tariff: Alternative	2 196.13	-	283.36	-	-	-	-	-		558	195.327	2.230
1	Bulk Time Of Use Tariff: Alternative MV	2 196.13	-	283.36	-	-	-	-	-		734	153.847	2.187
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	2 226.13	-	283.36	-	-	-	-	-0.77				
1	Net Metering Commercial:Basic Charge <= 20 kVA per month	838.03	-	-	2.67	-	-	-	-0.77	#DIV/0!			#DIV/0!
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	-	-	-	-	-				
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	-	-	-	-	-				
1	Streetlights - Internal Tariff	-	-	-	1.69	-	-	-	-		52		25.151
1	Wheeling Charges:	500.00	2 196.13	283.36	-	-	-	-	-				
1	Availability	200.00	-	-	-	-	-	-	-			310.330	

13.6. Key findings

The following key findings can be made in terms of the tariff levels and structures:

- Indigent customers are seriously under charged and thus cross-subsidised. This is due the lack of fixed charges, the low first 2 blocks energy rates and FBE.
- Households alternative are also seriously cross-subsidised due to the same issues as for Indigent consumers.
- Other domestic consumers are close to cost or slightly overcharged.
- Commercial customers without basic charges are overcharged when average consumption is high and undercharged when low.
- All other commercial tariffs are extensively overcharged.
- Bulk consumers at LV and MV are undercharged but municipal supplies overcharged due to bad load factors.
- TOU at MV and LV customers are slightly overcharged.
- Streetlight tariffs are too low and do not cover the fixed maintenance costs.

14. PRICING STUDY

Now that the costs are known and how it differs from revenue, new tariffs can be developed. The first step in this process is to develop a new pricing policy.

14.1. Pricing Policy Drivers

It is now clear that the tariffs fall short in being cost reflective tariffs. The challenge is to determine what must guide the changes to be made to become more cost reflective. This section proposes the pricing principles and policies to be followed in making tariff changes.

The key sources used for purpose of formulating these policies are:

- The South African Constitution.
- The South African Electricity Pricing Policy (EPP).
- Municipal Finance Management Act (MFMA).
- Municipal Systems Act (MSA).

NERSA regulates the electricity tariffs in South Africa. The NERSA policies and guidelines thus have to be followed. There are however various NERSA guidelines in conflict with some of the legislation and regulations. The results of the cost of supply study must thus be used to move NERSA in accepting the municipal proposals.

2.1 General Tariff Principles

Section 16 of the Electricity Regulation Act of 2006 states that the setting of prices, charges, tariffs and the regulation of revenues:

a. must enable an efficient licensee to recover the full cost of its licensed activities, including a reasonable margin or return;

b. must provide for or prescribe incentives for continued improvement of the technical and economic efficiency with which services are to be provided;

c. must give end users proper information regarding the costs that their consumption imposes on the licensee's business;

d. must avoid undue discrimination between customer categories; and

e. may permit the cross-subsidy of tariffs to certain categories of customers.

Principles obtained from the Municipal Systems Act are as follows:

a. Users of municipal services should be treated equitably in the application of tariffs.

b. The amount individual users pay for services should generally be in proportion to their use of that service.

c. Low income households must have access to at least basic services through:

- tariffs that cover only operating and maintenance costs;
- special tariffs or life line tariffs for low levels of use or consumption of services or for basic levels of service; or
- any other direct or indirect method of subsidisation of tariffs for low income households.

d. Tariffs must reasonable reflect the costs associated with rendering the service, including capital, operating, maintenance, administration and replacement costs, and interest charges.

e. Tariffs must be set at levels that facilitate the financial sustainability of the service, taking into account subsidisation from sources other than the service concerned.

f. Provision may be made for the promotion of local economic development through special tariffs for categories of commercial and industrial users.

g. The economical, efficient and effective use of resources, the recycling of waste and other appropriate environmental objectives must be encouraged.

h. The extent of subsidisation of tariffs for low income households and other categories of users should be fully disclosed.

i. A tariff policy may differentiate between different categories of users, debtors, service providers, services, service standards, geographical areas and other matters as long as such differentiation does not amount to unfair discrimination.

14.2. Pricing policy.

In view of the findings to date, the summarised pricing policy is provided below:

- It should be in line with the National Electricity Pricing Policy.
- All tariffs should be set as close as possible to the cost of supply.
- Indigent customers as registered in terms of indigent policy.
  - These customers limited to 20 Amps with no fixed charges.
  - The current IBT energy rates be retained.
  - Free Basic Electricity (FBE) of 50 kWh/m off-set by equitable share.
  - The cost of FBE be based on the second block price, thus first block removed.
- Cross subsidisation of low usage domestic customers (poor but not indigent) customers should be done as follows:
  - Customers limited to 20 Amps with no fixed charges.
  - The current IBT energy rates be retailed but first block price be set equal to the second block.
  - No FBE is granted.
- All small customers (domestic / business) > 20 Amp should have a fully cost reflective tariff:
  - A basic charge to reflect the fixed metering, billing, revenue collection and customer services costs.
  - A capacity charge based on the installed / limited capacity of the customer. In other words, the total network costs as calculated for that tariff before (using the relevant demand allocation method), is now divided by the customers' actual capacity.
  - An energy charge that covers the full energy cost, losses and surplus mark-up.
- All large customers should be charged on a TOU tariff with structure and TOU slots as per the Eskom Megaflex tariff applicable to Swartland including changes over time:
  - Basic charge.
  - Capacity charge based on the highest of the following:
    - Notified demand or highest **annual** maximum demand to cover Eskom Access charge plus dedicated municipal network costs.
  - Maximum demand charge based on **monthly** highest maximum during Peak and Standard Periods only.
  - Energy charges for:
    - High Demand (June, July and August) and Low demand (all other months)
    - Peak, Standard and Off-peak (See diagram below)

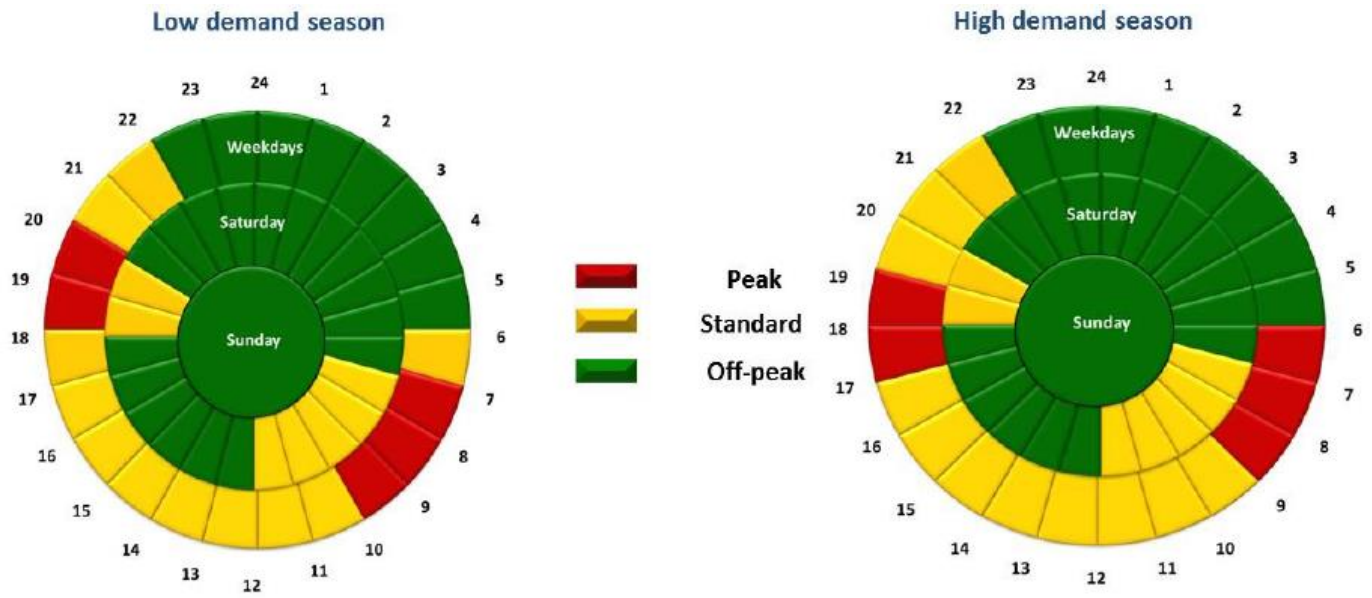
- Reactive energy charge based on kvarh in excess of 30% of kWh during all peak and Standard period for both seasons.
- Public holidays treated as the day they fall on.
- The tariffs should be different small consumers (<100 kVA), LV and MV.

This means that each customer will pay an average price depending on its own TOU ratio's and load factor. This is the same as applied by Eskom on its TOU tariffs.

TOU periods are as shown in

Figure 17**.**

Figure 17



- Co-generation charges. (SSEG-tariff)
  - The standard Access / Capacity charges remain.
  - Energy purchased by the customer be charged at the relevant standard tariff charges.
  - An additional basic charge be levied to cover the additional metering / billing costs.
- The energy purchased from the customer be credited on TOU period based on 90% of Eskom TOU energy rates (excluding non-TOU energy charges such as levies).

14.3. Cross subsidies to the poor.

In view of the proposed pricing policy, it is further proposed that the tariffs for Indigents and 20 Amp customers are not increased structurally. The extent of the cross subsidy in this case is then calculated.

The results of these calculations are shown in Table 48.

Table 48

SUBSIDY ANALYSIS

Tariffs to be subsidised	Customers	Tot Cost	Current revenue	Shortfall	FBE	Subsidy	% subsidy
Pre-paid meter system (Indigent Residential)	6 224	56 649 186	29 615 493	27 033 692	4 916 250	22 117 442	39%
Households Alternative <20 Amp:-	360	3 730 685	3 177 179	553 506		553 506	15%
TOTAL		**60 379 871**	**32 792 672**	**27 587 199**	**4 916 250**	**22 670 948**	38%
Total revenue excluding subsidy customers		395 674 234					
Total subsidy as % of Base revenue						**5.73%**	

This subsidy % is of non-subsidised revenue. The question thus is what the charge for the indigent customers should be.

Table 49 shows the calculation of the marginal Eskom purchase costs. The marginal costs do not refer to the average Eskom purchase price but the price of the domestic customers on its own. In other words, the impact that domestic customers have on increasing the access charge, maximum demand charge, energy charges during the various periods and the reactive energy charges.

Table 49

DOMESTIC ENERGY /MARGINAL ESKOM COST ANALYSIS			
Eskom			2023/2024
'Transmission network charges [R/kVA/m]		R/kVA/m	12.42
Distribution network charges			
'Network capacity charge		R/kVA/m	24.18
'Network demand charge		R/kVA/m	45.84
'Urban low voltage subsidy charge [R/kVA/m		R/kVA/m	-

Energy charges				Ancillary service charge [c/kWh]	Electrification and rural network subsidy charge [c/kWh]	Total
'High demand season [Jun -	Peak	c/kWh	481.44	0.60	11.73	493.77
	Standard	c/kWh	145.83	0.60	11.73	158.16
	Off Peak	c/kWh	79.21	0.60	11.73	91.54
'Low demand season [Sep - May]						
	Peak	c/kWh	157.03	0.60	11.73	169.36
	Standard	c/kWh	108.08	0.60	11.73	120.41
	Off Peak	c/kWh	68.54	0.60	11.73	80.87

Domestic characteristics										
DATA PER	HIGH SEASON			LOW SEASON						
BILLING CYCLE	P	S	O	P	S	O	Monthly LF	Annual LF	Reactive Energy	Losses
MONTH	kWh (FOR)	kWh (FOR)	kWh (FOR)	kWh (FOR)	kWh (FOR)	kWh (FOR)	%	%	% of kWh	
Domestic	4%	12%	12%	12%	28%	32%	42%	33%		7.95%
Dom Poor	4%	12%	12%	12%	28%	32%	42%	33%		7.95%

VENDING COST			
Cost	PP cust	R/cust/m	PP Rev
1371971	14018	8.156005	92098193

EFFECTIVE R/KWH	'Transmission network charges [R/kVA/m]	Distribution network charges			Energy charges'High demand season [Jun - Aug]			Energy charges 'Low demand season [Sep - May]						Eskom Increase	Vending	GRAND TOTAL
c/KWH		'Network capacity charge	'Network demand charge	Urban low voltage subsidy charge [R/kVA/m]	Peak	Standard	Off Peak	Peak	Standard	Off Peak	Reactive Energy	Sub-Total Energy	Total		R/cust/m	
	R/kVA/m	R/kVA/m	R/kVA/m	R/kVA/m	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh		R 8	
Eskom charges	**12.42**	**24.18**	**45.84**	**0**	**493.77**	**158.16**	**91.54**	**169.36**	**120.41**	**80.87**	**21.19**				c/kWh	c/kWh
Domestic	5.509	8.428	15.977	-	22.19	20.19	11.85	22.25	35.92	28.13	-	**140.52**	**170.44**	170.4366	2.16	172.59
Dom Poor	5.509	8.428	15.977	-	22.19	20.19	11.85	22.25	35.92	28.13	-	**140.52**	**170.44**	170.4366	2.81	173.25
-																

The following in this respect:

- The Megaflex charges are those applicable to Swartland municipality.
- The TOU consumption ratios and load factors were calculated from the representative load profiles.
- The monthly vending costs is the total vending cost divided by the number of customers divided by 12. This is then converted to a c/kWh for each domestic tariff category.
- This shows that the marginal cost of Eskom purchases for Indigent customers is 166 c/kWh in 2023/2024 values.
- In time this can be reviewed depending on the subsidy on non-subsidised customers.

The equitable share is calculated as shown in Table 50 and compared with the actual amount applied. What this is showing is that the subsidy provided by the equitable share covers more than required for indigent consumers and in fact also covers the subsidies to other poor domestic consumers. It is thus proposed that the equitable share for FBE be calculated at the second block price not the first block.

Table 50

EQUITABLE SHARE VALUE CALCULATION							
TARIFF	CUSTOMERS	FBE KWH	BASIC CHARGE SUBSIDY	ENERGY CHARGE	TOTAL BASIC SUBSIY	TOTAL UNITS SUBSIDY	TOTAL FBE SUBSIDY
Pre-paid meter system (Indigent Residential)	6 224.00	3 346 700.00		1.47	-	4 916 250.48	4 916 250.48
PROPOSED							
Pre-paid meter system (Indigent Residential)	6 976.00	3 346 700.00		1.93	-	6 448 251.89	6 448 251.89

Table 51 shows the subsidy with the proposed restructured tariffs.

Table 51

SUBSIDY ANALYSIS: NEW							
Tariffs to be subsidised	**Customers**	**Tot Cost**	**New revenue**	**Shortfall**	**FBE**	**Subsidy**	
Pre-paid meter system (Indigent Residential)	6 224	56 649 186	29 615 493	27 033 692	6 448 252	20 585 440	36%
Households Alternative <20 Amp:-	360	3 730 685	3 265 266	465 419		465 419	12%
TOTAL	**0**	**60 379 871**	**32 880 760**	**27 499 111**	**6 448 252**	**21 050 859**	35%
0	0	0	0	0	0		
Total revenue excluding subsidy customers	0	395 674 234	-	-	0		
Total subsidy as % of Base revenue					5.32%	**5.32%**	

15. PROPOSED TARIFFS

In view of the proposed pricing policy the following tariffs are proposed for Swartland as shown below:

Table 52. It shows the following:

- The current tariffs,
- The current costs escalated to 2023/2024.

Table 53. It shows the following:

- The current tariff
- The proposed rates before annual price increase and phase in.

Table 52

SWARTLAND		2023/2024 Tariffs											2022/2023 cost escalated to 2023/2024											
1						Hi Demand		3	Low demand		9		Escalation	Already done		0.00%	Hi Demand		3	Low demand		9	
1						Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy					Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy
PROPOSED TARIFFS		Basic charge	Capacity	MD / kVA	ALL Energy	Block 1 energy	Block 2 energy	BLock 3 energy	BLock 4 energy	BLock 5 energy			Basic charge	Access / kVA	MD / kVA	Energy	Block 1 energy	Block 2 energy	BLock 3 energy	BLock 4 energy	BLock 5 energy		
Nr	TARIFF NAME	Rand/ month	Rand/ kVA/m	Rand/ kVA	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	Rand/ month	Rand/ kVA/m	Rand/ kVA/m	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	
1	Pre-paid meter system (Indigent Residential)	-	-	-	-	-	1.927	2.747	3.301	-	-	-				3.0266							
1	Households Alternative <20 Amp:-	-	-	-	-	1.469	1.927	2.747	3.301	-	-	-				2.9756							
1	Pre-paid Meter System (Non-Indigent Residential)	-	-	-	-	3.006	3.273	-	-	-	-	-	65.90	6.64		1.9155							
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	317.68	-	-	-	1.602	2.060	2.900	3.415	-	-	-	65.90	6.64		1.9155							
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	317.68	-	-	-	1.602	2.060	2.900	3.415	-	-	-	65.90	6.64		1.9155							
1	Net Metering Residential (for Approved SSEG Households)	347.68	-	-	-	2.426	3.415	-	-	-	-	-	65.90	6.64			7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Commercial Pre-paid:-	-	-	-	3.567	-	-	-	-	-	-	-	93.48	12.27		2.0414							
1	Commercial Alternative < 15 AMP:-	-	-	-	3.567	-	-	-	-	-	-	-				3.8810							
1	Commercial Alternative < 15 AMP:-Dept	-	-	-	3.567	-	-	-	-	-	-	-				3.8810							
1	Commerce / Non Standard (per kWh)	-	14.91	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce / Non Standard (per kWh)-Dept	-	14.91	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic < 20KVA (Basic per month)	808.03	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic < 20KVA (Basic per month)-Dept	808.03	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic 20 to 40 KVA (Basic per month)	1 062.84	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	1 062.84	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic >40 KVA (Basic per month)	1 939.79	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Commerce Basic >40 KVA (Basic per month)-Dept	1 939.79	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-	2.0414							
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	838.03	-	-	2.67	-	-	-	-	-	-	-	93.48	12.27			7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	2.67	-	-	-	-	-	-	-	93.48	12.27			7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	2.67	-	-	-	-	-	-	-	93.48	12.27			7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Sports Grounds including maintenance of Floodlighting:-	-	-	-	5.29	-	-	-	-	-	-	-				229.07							
1	Bulk Industrial	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	471.28	63.47	76.06		7.0126	2.2462	1.3001	2.4053	1.7101	1.1485	0.2511
1	Bulk Industrial-Dept	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	471.28	63.47	76.06		7.0126	2.2462	1.3001	2.4053	1.7101	1.1485	0.2511
1	Bulk Industrial mv	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	619.17	49.44	60.65		6.8895	2.2068	1.2772	2.3630	1.6801	1.1284	0.2511
1	Net Metering Industrial (for Approved SSEG)	2 226.13	-	422.50	1.04	-	-	-	-	-	-	-	471.28	63.47	76.06		7.0126	2.2462	1.3001	2.4053	1.7101	1.1485	0.2511
1	Bulk Time Of Use Tariff: Alternative	2 196.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	471.28	63.47	76.06		7.0126	2.2462	1.3001	2.4053	1.7101	1.1485	0.2511
1	Bulk Time Of Use Tariff: Alternative MV	2 196.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	619.17	49.44	60.65		6.8895	2.2068	1.2772	2.3630	1.6801	1.1284	0.2511
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	2 226.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	471.28	63.47	76.06		7.0126	2.2462	1.3001	2.4053	1.7101	1.1485	0.2511
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	838.03	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-		7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-		7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	2.673	-	-	-	-	-	-	-	93.48	12.27	-		7.2631	2.3265	1.3465	2.4912	1.7712	1.1896	0.2511
1	Streetlights - Internal Tariff	-	-	-	1.691	-	-	-	-	-	-	-	43.64		-	3.64							
1	Wheeling Charges:	500.00	2 196.13	283.36	-	-	-	-	-	-	-	-			-								
1	Availability	200.00	-	-	-	-	-	-	-	-	-	-		261.90	-								

Table 53

SWARTLAND		2023/2024 Tariffs											2023/2024 Proposed before phase in and increase										
1						Hi Demand		3	Low demand		9		Basic adjust.	Access /Demand adjust.	Energy adjust.	Cross-Subsidy adjust.	Hi Demand		3	Low demand		9	
1						Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	-3.34%	-3.34%	0.00%	5.32%	Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy
PROPOSED TARIFFS		Basic charge	Capacity	MD / kVA	ALL Energy	Block 1 energy	Block 2 energy	BLock 3 energy	BLock 4 energy	BLock 5 energy			Basic charge	Access / kVA	MD / kVA	Energy	Block 1 energy	Block 2 energy	BLock 3 energy	BLock 4 energy	BLock 5 energy		
Nr	TARIFF NAME	Rand/ month	Rand/ kVA/m	Rand/ kVA	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	Rand/ month	Rand/ kVA/m	Rand/ kVA/m	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh
1	Pre-paid meter system (Indigent Residential)	-	-	-	-	-	1.927	2.747	3.301	-	-	-					-	1.927	2.747	3.301		-	
1	Households Alternative <20 Amp:-	-	-	-	-	1.469	1.927	2.747	3.301	-	-	-					1.927	1.927	2.747	3.301		-	
1	Pre-paid Meter System (Non-Indigent Residential)	-	-	-	-	3.006	3.273	-	-	-	-	-	67.09	6.76	-	2.0174						-	
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	317.68	-	-	-	1.602	2.060	2.900	3.415	-	-	-	67.09	6.76	-	2.0174						-	
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	317.68	-	-	-	1.602	2.060	2.900	3.415	-	-	-	67.09	6.76	-	2.0174						-	
1	Net Metering Residential (for Approved SSEG Households)	347.68	-	-	-	2.426	3.415	-	-	-	-	-	67.09	6.76	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Commercial Pre-paid:-	-	-	-	3.567	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commercial Alternative < 15 AMP:-	-	-	-	3.567	-	-	-	-	-	-	-	-	-	-	4.0875							
1	Commercial Alternative < 15 AMP:-Dept	-	-	-	3.567	-	-	-	-	-	-	-	-	-	-	4.0875							
1	Commerce / Non Standard (per kWh)	-	14.91	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce / Non Standard (per kWh)-Dept	-	14.91	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic < 20KVA (Basic per month)	808.03	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic < 20KVA (Basic per month)-Dept	808.03	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic 20 to 40 KVA (Basic per month)	1 062.84	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	1 062.84	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic >40 KVA (Basic per month)	1 939.79	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Commerce Basic >40 KVA (Basic per month)-Dept	1 939.79	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	2.1500							
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	838.03	-	-	2.67	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	2.67	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	2.67	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Sports Grounds including maintenance of Floodlighting:-	-	-	-	5.29	-	-	-	-	-	-	-	-	-	-	5.2890							
1	Bulk Industrial	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	479.79	64.62	77.43	-	*6.4568*	*2.3921*	*1.5852*	*2.5277*	*1.9349*	*1.4560*	*0.2644*
1	Bulk Industrial-Dept	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	479.79	64.62	77.43	-	*6.4568*	*2.3921*	*1.5852*	*2.5277*	*1.9349*	*1.4560*	*0.2644*
1	Bulk Industrial mv	2 196.13	-	422.50	1.04	-	-	-	-	-	-	-	630.35	50.33	61.75	-	*6.3169*	*2.3402*	*1.5509*	*2.4729*	*1.8929*	*1.4244*	*0.2644*
1	Net Metering Industrial (for Approved SSEG)	2 226.13	-	422.50	1.04	-	-	-	-	-	-	-	479.79	64.62	77.43	-	*6.4568*	*2.3921*	*1.5852*	*2.5277*	*1.9349*	*1.4560*	*0.2644*
1	Bulk Time Of Use Tariff: Alternative	2 196.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	479.79	64.62	77.43	-	*6.4568*	*2.3921*	*1.5852*	*2.5277*	*1.9349*	*1.4560*	*0.2644*
1	Bulk Time Of Use Tariff: Alternative MV	2 196.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	630.35	50.33	61.75	-	*6.3169*	*2.3402*	*1.5509*	*2.4729*	*1.8929*	*1.4244*	*0.2644*
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	2 226.13	-	283.36	-	5.55	1.68	0.91	1.81	1.25	0.79	-	479.79	64.62	77.43	-	*7.3856*	*2.3657*	*1.3692*	*2.5332*	*1.8011*	*1.2096*	*0.2644*
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	838.03	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	1 092.84	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	1 969.79	-	-	2.673	-	-	-	-	-	-	-	95.17	12.49	-	-	7.6496	2.4502	1.4182	2.6237	1.8654	1.2528	0.2644
1	Streetlights - Internal Tariff	-	-	-	1.691	-	-	-	-	-	-	-	44.43	-	-	3.8378	-	-	-	-	-	-	-
1	Wheeling Charges:	500.00	2 196.13	283.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Availability	200.00	-	-	-	-	-	-	-	-	-	-	266.63		-	-							

A slight adjustment is made to achieve the revenue target as shown in green in **Table 54**.

Table 54

Basic adjust.	Access /Demand adjust.	Energy adjust.
-3.34%	-3.34%	0.00%

The following should be noted:

- The basic. Capacity and energy charges will be the same for all domestic consumers as proposed by the municipality. Although the cost of supply study indicates differences between indigent, low usage and high consumers.
- The basic charges for single and three phase consumers will not differ.

16. FINANCIAL IMPACT

The tariffs have been developed in a way that will ensure revenue neutrality from a tariff structure point of view:

- Provision has been made for customers to reduce their circuit breaker capacity thereby building in a small safety margin.
- With the application of cost reflective basic and amp charges, the net revenue loss when customers install renewable energy will be minimised.
- Some savings opportunity is opened by buying surplus renewable energy from customers at a price below that of Eskom power.
- With the more aggressive capacity charges, customers will be more inclined to reduce their peak capacity rather than energy thereby reducing Swartland's Eskom and own network costs without sacrificing much municipal revenue thereby increasing profitability.

The proposed tariffs thus hold very little risk but real opportunities.

17. TARIFF IMPACT

Table 55 below show the overall impact on customers on each tariff on average. This is for the tariffs before phase in (in other words the whole impact). The impact of each would be about a third of this if phased in over 3 years.

- All Indigents get Basic and capacity charge and 50 kWh/m for free.
- All other poor consumers willing to accept 20 Amps get the Basic for free.
- These discounts are to be recovered via the equitable share. The impact is similar to the current equitable share amount.

Table 55

SWARTLAND						
CALCULATED REVENUE		**2022/2023 Proposed**	**2022/2023 Reference**	**Difference**	**Structure change**	**Initial cost reflectiveness**
Nr	**TARIFF NAME**	**R/year**	**0.00%**	Rand	%	
1	Pre-paid meter system (Indigent Residential)	29 615 493	29 615 493	-	0.00%	-91.3%
1	Households Alternative <20 Amp:-	3 265 266	3 177 179	88 087	2.77%	-17.4%
1	Pre-paid Meter System (Non-Indigent Residential)	65 480 547	63 919 063	1 561 484	2.44%	3.1%
1	Residential Consumers (Houses, Flats & Farms) Network charge per	73 414 111	86 265 699	-12 851 588	-14.90%	17.3%
1	Residential Consumers (Houses, Flats & Farms) Network charge per	-	-	-	#DIV/0!	#DIV/0!
1	Net Metering Residential (for Approved SSEG Households)	778 547	920 475	-141 927	-15.42%	12.2%
1	Commercial Pre-paid:-	14 160 416	15 840 417	-1 680 001	-10.61%	14.2%
1	Commercial Alternative < 15 AMP:-	1 311 880	1 144 946	166 933	14.58%	-10.1%
1	Commercial Alternative < 15 AMP:-Dept	76 772	67 003	9 769	14.58%	14.1%
1	Commerce / Non Standard (per kWh)	4 158 111	3 994 336	163 775	4.10%	-1.4%
1	Commerce / Non Standard (per kWh)-Dept	133 971	120 353	13 618	11.32%	-3.2%
1	Commerce Basic < 20KVA (Basic per month)	2 479 504	3 555 275	-1 075 771	-30.26%	40.6%
1	Commerce Basic < 20KVA (Basic per month)-Dept	229 815	339 419	-109 604	-32.29%	49.6%
1	Commerce Basic 20 to 40 KVA (Basic per month)	6 652 159	7 709 107	-1 056 948	-13.71%	18.8%
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	628 459	785 424	-156 965	-19.98%	36.3%
1	Commerce Basic >40 KVA (Basic per month)	17 078 204	19 769 146	-2 690 942	-13.61%	22.1%
1	Commerce Basic >40 KVA (Basic per month)-Dept	439 546	738 617	-299 070	-40.49%	51.2%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!	#DIV/0!
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	#DIV/0!	0.00%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!	0.0%
1	Sports Grounds including maintenance of Floodlighting:-	561	561	-	0.00%	0.0%
1	Bulk Industrial	64 140 908	53 036 074	11 104 834	20.94%	-10.0%
1	Bulk Industrial-Dept	6 147 557	7 315 284	-1 167 728	-15.96%	20.8%
1	Bulk Industrial mv	87 604 998	77 899 064	9 705 934	12.46%	-2.0%
1	Net Metering Industrial (for Approved SSEG)	-	-	-	#DIV/0!	0.0%
1	Bulk Time Of Use Tariff: Alternative	11 237 350	11 001 518	235 832	2.14%	5.4%
1	Bulk Time Of Use Tariff: Alternative MV	39 229 085	37 389 029	1 840 056	4.92%	3.3%
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	-	-	-	#DIV/0!	0.0%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!	0.0%
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	#DIV/0!	0.0%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!	0.0%
1	Streetlights - Internal Tariff	5 569 933	433 296	5 136 638	1185.48%	0.0%
1	Wheeling Charges:	-	-	-	#DIV/0!	0.0%
1	Availability	4 572 952	3 430 130	1 142 822	33.32%	-31.0%
1	**Total.**	**438 406 144**	**428 466 906**	**9 939 238**	2.32%	**0.0%**
1		438 406 144	**0.00%**	**-**		

The following impacts will be experienced over the phase in period using the second option.

- Indigent customers will be limited to 20 Amp only.
- Domestic 20 Amp lifeline consumers will pay more for the first block.
- The general trend for other tariffs is as follows:
    - The category will move closer to cost reflective but still retaining the cross subsidy.

The impact for each customer will however be different. It will depend on the utilisation of the capacity provided to customers and the extent to which electricity is used in the peak times:

- The following customers will generally see increased bills:
    - Those that are not utilising their capacity and are not willing to reduce / manage their capacity, due to the Capacity/Access charges.
    - Customers who need high capacity only for a few months in the year.
    - TOU customers who use a lot of electricity during the expensive Winter Peak times and are not willing / able to shift load out of these periods.

If these tariffs are phased in over 3 years, customers will have time to adapt to the new rates and thus manage their bills. The impacts shown in the table above will thus be 1/3 for each of the 3 years.

18. CUSTOMER IMPACT

The detailed impact on domestic customers have been further analysed and is illustrated. Table 56 shows the revenue on existing and proposed tariffs, then the Rand impact of the % change. It also shows the number of consumers on each tariff and the average consumption and selected capacity of these.

Table 56

DOMESTIC TARIFF IMPACT:														
RESTRUCTURED WITHOUT PRICE INCREASE AND PHASE IN		Basic	Capacity	Energy										
Existing Tariff	Capacity	Per month	Per A (installed)	Block 1 rate	Block 1 size	Block 2 rate	Block 2 size	Block 3 rate	Block 3 size	Block 4 rate	Block 4 size	Rest rate		
2023/2024	Amps	R/m	R/A/m	c/kWh	kWh/m	c/kWh	kWh/m	c/kWh	kWh/m	c/kWh	kWh/m	c/kWh	Customers	kWh/m
Pre-paid meter system (Indigent Residential)	20	0.000	0.000	1.469	50.00	1.927	350.00	2.747	600	3.301	100000		6224	251
Pre-paid Meter System (Non-Indigent Residential)	30	0.000	0.000	3.006	50.00	3.006	350.00	3.273	600	3.273	100000		360	340
Households Alternative <20 Amp:-	40	0.000	0.000	1.602	50.00	1.602	350.00	2.060	600	2.060	100000		6976	254
Households and Farming Consumers Non Indigent:	40	317.684	0.000	1.602	50.00	2.060	350.00	2.900	600	3.415	100000		5561	405
													19121	298
Proposed														
Pre-paid meter system (Indigent Residential)	20			0.000	50.00	2.141	250.00	3.052	600	3.668	100000			
Households Alternative <20 Amp:-	20			1.927	50.00	1.927	250.00	2.747	600	3.301	100000			
Res 1 ph > 20 Amps	30	67.09	6.76	2.017	100000.00									
Res 1 ph > 20 Amps	40	67.09	6.76	2.017	100000.00									
Res 1 ph > 20 Amps	50	67.09	6.76	2.017	100000.00									
Res 1 ph > 20 Amps	60	67.09	6.76	2.017	100000.00									
Res 1 ph > 20 Amps	120	67.09	6.76	2.017	100000.00									
												new	new	
IMPACT: TOTAL IMPACT EXCLUDING PRICE INCREASE		kWh/m		100										
Amps	**Exis**	**0**		**50**	**100**	**200**	**300**	**400**	**500**	**600**	**700**	**800**	**900**	**1000**	**1100**
	Exis-Pre-paid meter system (Indigent Residential	0		73	170	362	555	789	1 064	1 338	1 668	1 998	2 329	2 659	2 989
	Exis-Pre-paid Meter System (Non-Indigent Resid	0		150	301	601	902	1 216	1 543	1 871	2 198	2 525	2 853	3 180	3 507
	Exis-Households Alternative <20 Amp:-	0		80	160	320	481	664	870	1 076	1 282	1 488	1 694	1 900	2 106
	Exis-Households and Farming Consumers Non I	318		398	501	707	913	1 161	1 451	1 741	2 082	2 424	2 765	3 107	3 448
	to														
Amps	**Prop**	**0**		**50**	**100**	**200**	**300**	**400**	**500**	**600**	**700**	**800**	**900**	**1 000**	**1 100**
20	Prop-Pre-paid meter system (Indigent Residentia	0		0	107	321	581	886	1 191	1 497	1 863	2 230	2 597	2 964	3 331
20	Prop-Households Alternative <20 Amp:-20	0		96	193	385	619	894	1 168	1 443	1 773	2 103	2 434	2 764	3 094
30	Prop-Res 1 ph > 20 Amps30	270		371	472	673	875	1 077	1 279	1 480	1 682	1 884	2 085	2 287	2 489
40	Prop-Res 1 ph > 20 Amps40	337		438	539	741	943	1 144	1 346	1 548	1 750	1 951	2 153	2 355	2 557
50	Prop-Res 1 ph > 20 Amps50	405		506	607	808	1 010	1 212	1 414	1 615	1 817	2 019	2 221	2 422	2 624
60	Prop-Res 1 ph > 20 Amps60	473		573	674	876	1 078	1 279	1 481	1 683	1 885	2 086	2 288	2 490	2 692
120	Prop-Res 1 ph > 20 Amps120	878		979	1 080	1 281	1 483	1 685	1 887	2 088	2 290	2 492	2 694	2 895	3 097
Amps	**CHANGE IN REVENUE**														
20.00	Exis-Pre-paid meter system (Indigent Residential	0		-73	-63	-41	26	97	128	158	195	232	268	-216	-176
20.00	Exis-Pre-paid Meter System (Non-Indigent Resid	0		-54	-108	-216	-283	-322	-375	-427	-425	-422	-419	-416	-413
30.00	Exis-Households Alternative <20 Amp:- to Prop-I	0		16	32	65	138	230	299	367	491	615	740	864	988
30.00	Exis-Households Alternative <20 Amp:- to Prop-F	270		291	311	353	394	413	409	404	400	396	391	387	383
40.00	Exis-Households Alternative <20 Amp:- to Prop-F	337		358	379	420	462	481	476	472	468	463	459	455	450
50.00	Exis-Households Alternative <20 Amp:- to Prop-F	405		426	446	488	529	548	544	540	535	531	527	522	518
60.00	Exis-Households Alternative <20 Amp:- to Prop-F	473		493	514	556	597	616	611	607	603	598	594	590	586
120.00	Exis-Households Alternative <20 Amp:- to Prop-F	878		899	919	961	1 002	1 021	1 017	1 013	1 008	1 004	1 000	995	991
30.00	Exis-Households and Farming Consumers Non I	-48		-27	-29	-34	-38	-84	-172	-261	-400	-540	-680	-819	-959
40.00	Exis-Households and Farming Consumers Non I	20		40	38	34	30	-17	-105	-193	-333	-472	-612	-752	-892
50.00	Exis-Households and Farming Consumers Non I	87		108	106	102	97	51	-37	-125	-265	-405	-545	-684	-824
60.00	Exis-Households and Farming Consumers Non I	155		176	173	169	165	119	30	-58	-198	-337	-477	-617	-756
120.00	Exis-Households and Farming Consumers Non I	560		581	579	575	570	524	436	348	208	68	-72	-211	-351
														Customers	kWh/m
Amps	**CHANGE %**	**0**		**50**	**100**	**200**	**300**	**400**	**500**	**600**	**700**	**800**	**900**	**1 000**	**1 100**
20.00	Exis-Pre-paid meter system (Indigent Residential) to Prop-P	-100.0%		-37.0%	-11.4%	4.6%	12.3%	12.0%	11.8%	11.7%	11.6%	11.5%	-8.1%	-5.9%	
20.00	Exis-Pre-paid Meter System (Non-Indigent Residential) to P	-35.9%		-35.9%	-35.9%	-31.4%	-26.5%	-24.3%	-22.8%	-19.3%	-16.7%	-14.7%	-13.1%	-11.8%	
30.00	Exis-Households Alternative <20 Amp:- to Prop-Res 1 ph >	193.3%		103.6%	58.7%	43.7%	34.0%	26.5%	21.6%	18.2%	15.7%	13.7%	12.2%	10.9%	
40.00	Exis-Households Alternative <20 Amp:- to Prop-Res 1 ph >	238.3%		126.0%	69.9%	51.2%	39.5%	30.9%	25.2%	21.3%	18.3%	16.1%	14.3%	12.8%	
50.00	Exis-Households Alternative <20 Amp:- to Prop-Res 1 ph >	283.2%		148.5%	81.2%	58.7%	45.1%	35.2%	28.8%	24.4%	21.0%	18.5%	16.4%	14.8%	
30.00	Exis-Households and Farming Consumers Non Indigent: to	-33.9%		-18.3%	-10.5%	-7.9%	-12.7%	-19.8%	-24.2%	-31.2%	-36.3%	-40.1%	-43.1%	-45.5%	
40.00	Exis-Households and Farming Consumers Non Indigent: to	50.5%		23.9%	10.6%	6.2%	-2.5%	-12.0%	-17.9%	-26.0%	-31.7%	-36.1%	-39.6%	-42.3%	
50.00	Exis-Households and Farming Consumers Non Indigent: to	134.8%		66.1%	31.7%	20.2%	7.7%	-4.3%	-11.7%	-20.7%	-27.2%	-32.1%	-36.0%	-39.1%	
60.00	Exis-Households and Farming Consumers Non Indigent: to	219.2%		108.2%	52.8%	34.3%	17.9%	3.5%	-5.4%	-15.4%	-22.7%	-28.2%	-32.5%	-35.9%	
120.00	Exis-Households and Farming Consumers Non Indigent: to	725.2%		361.3%	179.3%	118.6%	78.9%	50.1%	32.3%	16.2%	4.6%	-4.2%	-11.1%	-16.7%	

The average percentages only represent the average. The case will be different for each customer. It will depend largely on how effective customers utilise their capacity. In other words, customers with large capacity and low consumption will see higher increases and those with low capacity and high consumption will see lower increases. This clearly shows that only customers that are not willing to reduce / manage their capacity or have irregular usage over the months in the year will pay significantly more. If these tariffs are phased in over 3 years customers will have time to adapt to the new rates and thus manage their bills.

The impact on Business consumers is illustrated here. Table 57 below show the existing and proposed tariffs.

Table 57

Commercial												
RESTRUCTURED WITHOUT PRICE INCREASE AND PHASE IN		Basic	Capacity	Energy								
Existing Tariff	Capacity	Per month	Per A (installed)	R/kWh	Block 1 size	Consumers	kWh/m					
2023/2024	Amps	R/m	R/A/m	c/kWh	kWh/m							
Commercial Pre-paid:-, <15 Amp		0.000	0.000	3.567	100000.00	818	452					
Commerce / Non Standard (per kWh)		0.000	14.913	2.673	100000.00	116	996					
Commerce Basic < 20KVA		808.031	0.000	2.673	100000.00	176	327					
Commerce Basic 20 to 40 KVA		1062.843	0.000	2.673	100000.00	157	1 133					
Commerce Basic >40 KVA		1939.788	0.000	2.673	100000.00	240	1 842					
Proposed												
Commercial 20	20	0.00	0.00	4.09	100000.00							
Commercial 30	30	95.17	12.49	2.15	100000.00							
Commercial 40	40	95.17	12.49	2.15	100000.00							
Commercial 50	50	95.17	12.49	2.15	100000.00							
Commercial 80	80	95.17	12.49	2.15	100000.00							
Commercial 90	90	95.17	12.49	2.15	100000.00							
Commercial 120	120	95.17	12.49	2.15	100000.00							
Commercial 150	150	95.17	12.49	2.15	100000.00							
Commercial 180	180	95.17	12.49	2.15	100000.00							
Commercial 210	210	95.17	12.49	2.15	100000.00							
Commercial 240	240	95.17	12.49	2.15	100000.00							
IMPACT: TOTAL IMPACT EXCLUDING PRICE INCREASE		kWh/m	200									
Amps	EXISTING REVENUE	0	200	400	600	800	1000	1200	1400	1600	1800	2000
20	Commercial Pre-paid:-, <15 Amp	0	713	1 427	2 140	2 854	3 567	4 281	4 994	5 708	6 421	7 135
15	Commerce / Non Standard (per kWh)	224	758	1 293	1 828	2 362	2 897	3 432	3 966	4 501	5 036	5 570
90	Commerce Basic < 20KVA	808	1 343	1 877	2 412	2 947	3 481	4 016	4 551	5 085	5 620	6 155
180	Commerce Basic 20 to 40 KVA	1 063	1 598	2 132	2 667	3 201	3 736	4 271	4 805	5 340	5 875	6 409
240	Commerce Basic >40 KVA	1 940	2 474	3 009	3 544	4 078	4 613	5 148	5 682	6 217	6 752	7 286
	to											
Amps	PROPOSED REVENUE											
20	Commercial 20	0	818	1 635	2 453	3 270	4 088	4 905	5 723	6 540	7 358	8 175
30	Commercial 30	470	900	1 330	1 760	2 190	2 620	3 050	3 480	3 910	4 340	4 770
40	Commercial 40	595	1 025	1 455	1 885	2 315	2 745	3 175	3 605	4 035	4 465	4 895
50	Commercial 50	720	1 150	1 580	2 010	2 440	2 870	3 300	3 730	4 160	4 590	5 020
80	Commercial 80	1 095	1 525	1 955	2 385	2 815	3 245	3 675	4 105	4 535	4 965	5 395
90	Commercial 90	1 220	1 650	2 080	2 510	2 940	3 370	3 800	4 230	4 660	5 090	5 520
120	Commercial 120	1 595	2 025	2 455	2 885	3 315	3 745	4 175	4 605	5 035	5 465	5 895
150	Commercial 150	1 969	2 399	2 829	3 259	3 689	4 119	4 549	4 979	5 409	5 839	6 269
180	Commercial 180	2 344	2 774	3 204	3 634	4 064	4 494	4 924	5 354	5 784	6 214	6 644
210	Commercial 210	2 719	3 149	3 579	4 009	4 439	4 869	5 299	5 729	6 159	6 589	7 019
240	Commercial 240	3 094	3 524	3 954	4 384	4 814	5 244	5 674	6 104	6 534	6 964	7 394
	//											
Amps	CHANGE IN REVENUE											
20.00	Commercial Pre-paid:-, <15 Amp to Commercial 20	0	104	208	312	416	520	624	728	832	936	1 040
30.00	Commercial Pre-paid:-, <15 Amp to Commercial 30	470	187	-97	-380	-664	-947	-1 231	-1 514	-1 798	-2 081	-2 365
40.00	Commercial Pre-paid:-, <15 Amp to Commercial 40	595	311	28	-255	-539	-822	-1 106	-1 389	-1 673	-1 956	-2 240
20.00	Commerce / Non Standard (per kWh) to Commercial 20	-224	59	342	625	908	1 191	1 473	1 756	2 039	2 322	2 605
30.00	Commerce / Non Standard (per kWh) to Commercial 30	246	142	37	-68	-172	-277	-382	-486	-591	-696	-800
40.00	Commerce / Non Standard (per kWh) to Commercial 40	371	267	162	57	-47	-152	-257	-361	-466	-571	-675
20.00	Commerce Basic < 20KVA to Commercial 20	-808	-525	-242	41	323	606	889	1 172	1 455	1 738	2 020
30.00	Commerce Basic < 20KVA to Commercial 30	-338	-443	-547	-652	-757	-861	-966	-1 071	-1 175	-1 280	-1 385
40.00	Commerce Basic < 20KVA to Commercial 40	-213	-318	-422	-527	-632	-736	-841	-946	-1 050	-1 155	-1 260
50.00	Commerce Basic < 20KVA to Commercial 50	-88	-193	-297	-402	-507	-611	-716	-821	-925	-1 030	-1 135
80.00	Commerce Basic < 20KVA to Commercial 80	287	182	77	-27	-132	-237	-341	-446	-551	-655	-760
90.00	Commerce Basic < 20KVA to Commercial 90	412	307	202	98	-7	-112	-216	-321	-426	-530	-635
120.00	Commerce Basic 20 to 40 KVA to Commercial 120	532	427	322	218	113	8	-96	-201	-306	-410	-515
150.00	Commerce Basic 20 to 40 KVA to Commercial 150	907	802	697	593	488	383	279	174	69	-35	-140
180.00	Commerce Basic 20 to 40 KVA to Commercial 180	1 281	1 177	1 072	967	863	758	653	549	444	339	235
210.00	Commerce Basic >40 KVA to Commercial 210	779	675	570	465	361	256	151	47	-58	-163	-267
240.00	Commerce Basic >40 KVA to Commercial 240	1 154	1 049	945	840	735	631	526	422	317	212	108
Amps	CHANGE %	0	200	400	600	800	1 000	1 200	1 400	1 600	1 800	2 000
20.00	Commercial Pre-paid:-, <15 Amp to Commercial 20		14.6%	14.6%	14.6%	14.6%	14.6%	14.6%	14.6%	14.6%	14.6%	14.6%
30.00	Commercial Pre-paid:-, <15 Amp to Commercial 30		26.1%	-6.8%	-17.8%	-23.3%	-26.6%	-28.8%	-30.3%	-31.5%	-32.4%	-33.1%
40.00	Commercial Pre-paid:-, <15 Amp to Commercial 40		43.7%	2.0%	-11.9%	-18.9%	-23.1%	-25.8%	-27.8%	-29.3%	-30.5%	-31.4%
20.00	Commerce / Non Standard (per kWh) to Commercial 20	-100.0%	7.8%	26.4%	34.2%	38.4%	41.1%	42.9%	44.3%	45.3%	46.1%	46.8%
30.00	Commerce / Non Standard (per kWh) to Commercial 30	110.1%	18.7%	2.9%	-3.7%	-7.3%	-9.6%	-11.1%	-12.3%	-13.1%	-13.8%	-14.4%
40.00	Commerce / Non Standard (per kWh) to Commercial 40	166.0%	35.2%	12.5%	3.1%	-2.0%	-5.2%	-7.5%	-9.1%	-10.4%	-11.3%	-12.1%
20.00	Commerce Basic < 20KVA to Commercial 20	-100.0%	-39.1%	-12.9%	1.7%	11.0%	17.4%	22.1%	25.8%	28.6%	30.9%	32.8%
30.00	Commerce Basic < 20KVA to Commercial 30	-41.8%	-33.0%	-29.2%	-27.0%	-25.7%	-24.7%	-24.1%	-23.5%	-23.1%	-22.8%	-22.5%
40.00	Commerce Basic < 20KVA to Commercial 40	-26.4%	-23.7%	-22.5%	-21.9%	-21.4%	-21.2%	-20.9%	-20.8%	-20.7%	-20.6%	-20.5%
50.00	Commerce Basic < 20KVA to Commercial 50	-10.9%	-14.4%	-15.8%	-16.7%	-17.2%	-17.6%	-17.8%	-18.0%	-18.2%	-18.3%	-18.4%
80.00	Commerce Basic < 20KVA to Commercial 80	35.5%	13.6%	4.1%	-1.1%	-4.5%	-6.8%	-8.5%	-9.8%	-10.8%	-11.7%	-12.3%
90.00	Commerce Basic < 20KVA to Commercial 90	50.9%	22.9%	10.8%	4.1%	-0.2%	-3.2%	-5.4%	-7.1%	-8.4%	-9.4%	-10.3%
120.00	Commerce Basic 20 to 40 KVA to Commercial 120	50.0%	26.7%	15.1%	8.2%	3.5%	0.2%	-2.3%	-4.2%	-5.7%	-7.0%	-8.0%
150.00	Commerce Basic 20 to 40 KVA to Commercial 150	85.3%	50.2%	32.7%	22.2%	15.2%	10.3%	6.5%	3.6%	1.3%	-0.6%	-2.2%
180.00	Commerce Basic 20 to 40 KVA to Commercial 180	120.6%	73.7%	50.3%	36.3%	26.9%	20.3%	15.3%	11.4%	8.3%	5.8%	3.7%
210.00	Commerce Basic >40 KVA to Commercial 210	40.2%	27.3%	18.9%	13.1%	8.8%	5.5%	2.9%	0.8%	-0.9%	-2.4%	-3.7%
240.00	Commerce Basic >40 KVA to Commercial 240	59.5%	42.4%	31.4%	23.7%	18.0%	13.7%	10.2%	7.4%	5.1%	3.1%	1.5%

It is believed that if phased in over 3 years this impact should be acceptable and the results should be very good for the municipality.

19. BULK TOU TARIFFS

TOU tariffs must continue to be applied to Bulk consumers and even be applied to small customers. This is because:

- It offers opportunities for customers to shift load thereby reducing their own costs without any detrimental financial impact on the municipality.

- It offers savings to the municipality when the system peaks are reduced due to customer load shifting.
- Municipal own purchase costs can be reduced when the tariff is applied to internal consumption points such as sewerage works.
- This is a requirement in terms of the EPP.

The Cost of Supply study follows an approach of applying % surcharges to achieve the required revenue. When this is applied to the TOU energy rates, the tariffs are seriously distorted. This is because the same % surcharge on the more expensive Peak energy charges cause a very high c/kWh mark-up compared with that on the cheaper off-peak period. This means that when customers shift load from the Peak to Standard or Off-peak, the loss in revenue far exceeds the savings in Eskom purchase costs.

The tariffs are then redesigned by applying the same c/kWh on all energy rates but to still achieve the same revenue as shown in Table 58. It also shows the load shifting impact of the initial tariffs. Under the proposed tariffs the load shift impact is zero as the mark-up in the different periods are the same and thus no net revenue (change in revenue minus charge in purchase cost) is lost.

Table 58

TOU TARIFF REDESIGN				HIGH SEASON CHARGES			LOW SEASON CHARGES				
		Access	MD (all hours)	Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	Total
		R/kVA	R/kVA	kWh	kWh	kWh	kWh	kWh	kWh	kvarh	0
ESKOM MEGAFLEX			Increase	0							
Megaflex at MV	2023/2024	43.36734	82.966698	5.851	1.874	1.085	2.007	1.427	0.958	0.2119	
With escalation	2023/2024	43.37	82.97	5.851	1.874	1.085	2.007	1.427	0.958	0.212	

				HIGH SEASON CHARGES			LOW SEASON CHARGES				
	Customer service	Access	MD (all hours)	Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	Total
	Customers	kVA	kVA	kWh	kWh	kWh	kWh	kWh	kWh	kvarh	Rand
Bulk TOU at MV	Markup	0.4662									
Consumption	7	16 640	142 632	2 078 624	5 669 315	6 399 311	5 996 170	15 874 930	18 758 487	195 560	
Initial tariff	630.351	50.328	61.750	7.256	2.324	1.345	2.489	1.769	1.188	0.264	
R/kWh markup				1.405	0.450	0.261	0.482	0.343	0.230		
% Markup				24.0%	24.0%	24.0%	24.0%	24.0%	24.0%		
Revenue: Initial Tariff	52 950	10 049 776	8 807 551	15 082 490	13 176 487	8 608 283	14 923 037	28 089 680	22 292 444	51 714	121 134 410
New tariff	630.35	50.33	61.75	6.317	2.340	1.551	2.473	1.893	1.424	0.264	(3 512 515)
Revenue: New tariff	4 412	837 481	8 807 551	13 130 410	13 267 520	9 924 391	14 828 182	30 050 189	26 720 044	51 714	117 621 895
R/kWh markup				0.466	0.466	0.466	0.466	0.466	0.466		
% Markup				7.97%	24.88%	42.98%	23.23%	32.68%	48.65%		
Load shift impact initial tariff:				Savings in Eskom cost	Lost revenue	Net impact	Savings in Eskom cost	Lost revenue	Net impact		
		Peak to Standard		3.98	4.93	**0.96**	0.58	0.72	**0.14**		
		Peak to Off-Peak		4.77	5.91	**1.14**	1.05	1.30	**0.25**		
		Standard to Off-peak		0.79	0.98	**0.19**	0.47	0.58	**0.11**		
Bulk TOU at LV	Markup	0.4914		Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy	129.6890872
Consumption	185	9 253	79 309	1 339 705	3 423 365	3 687 803	3 958 506	9 908 203	10 415 557	1 247 580	Rand
Initial tariff	479.79	64.62	77.43	7.386	2.366	1.369	2.533	1.801	1.210	0.264	
R/kWh markup				1.535	0.492	0.285	0.526	0.374	0.251		
% Markup				26.2%	26.2%	26.2%	26.2%	26.2%	26.2%		
Revenue: Initial Tariff	1 065 138	7 174 713	6 141 102	9 894 576	8 098 660	5 049 425	10 027 796	17 845 174	12 598 919	329 908	78 225 412
New tariff	479.79	64.62	77.43	6.457	2.392	1.585	2.528	1.935	1.456	0.264	3 512 826
Revenue: New Tariff	1 065 138	7 174 713	6 141 102	8 650 271	8 188 993	5 845 969	10 006 068	19 171 162	15 164 915	329 908	81 738 239
R/kWh markup				0.606	0.518	0.501	0.521	0.508	0.498	0.053	
% Markup				10.36%	27.64%	46.15%	25.96%	35.62%	51.95%	24.79%	
Load shift impact initial tariff:				Savings in Eskom cost	Lost revenue	Net impact	Savings in Eskom cost	Lost revenue	Net impact		
		Peak to Standard		3.98	5.02	**1.04**	0.58	0.73	**0.15**		
		Peak to Off-Peak		4.77	6.02	**1.25**	1.05	1.32	**0.28**		
		Standard to Off-peak		0.79	1.00	**0.21**	0.47	0.59	**0.12**		
SPU TOU at LV	Markup	0.4052		15082489.58	13176487.43	8608282.83	14923036.64	28089679.68	22292443.51	0	Total
Consumption	1 429	3 984	-	-	-	-	-	-	-	-	Rand
Initial tariff	-	-	-	-	-	-	-	-	-	-	
R/kWh markup				(5.851)	(1.874)	(1.085)	(2.007)	(1.427)	(0.958)	(0.212)	
% Markup				-100%	-100%	-100%	-100%	-100%	-100%	-100%	
Revenue: Initial Tariff	-	-	-	-	-	-	-	-	-	-	-
New tariff	-	-	-	6.256	2.279	1.490	2.412	1.832	1.363	0.212	-
Revenue: New Tariff	-	-	-	-	-	-	-	-	-	-	-
R/kWh markup				0.405	0.405	0.405	0.405	0.405	0.405	-	
% Markup				6.93%	21.62%	37.35%	20.19%	28.40%	42.28%	0.00%	
Load shift impact initial tariff:				Savings in Eskom cost	Lost revenue	Net impact	Savings in Eskom cost	Lost revenue	Net impact		
		Peak to Standard		3.98	-	**(3.98)**	0.58	-	**(0.58)**		
		Peak to Off-Peak		4.77	-	**(4.77)**	1.05	-	**(1.05)**		
		Standard to Off-peak		0.79	-	**(0.79)**	0.47	-	**(0.47)**		

The following is important to note from this change to TOU tariffs:

- The basic, capacity and demand charges remain the same.
- The energy charges are set with the same c/kWh markup on each Eskom TOU energy charge.
- The revenue from each TOU tariff remains the same (difference in yellow)
- This is done by adjusting the c/kWh markup (in green).

19.1. Bulk TOU tariff impact study

Although the cost of supply study proposes tariffs that are cost reflective with subsidies for the poor it is important to get an idea of the impact on individual customers. Normally individual impact studies are done for all Bulk customers. Not all load profile data available to the municipality was made available for analysis. There was also an argument that the load profile data may not be displayed with any customer names. The data that was made available was analysed to illustrate the individual customer impact.

The tariffs used for the analysis is shown in Table 59**.**

Table 59

TOU TARIFFS FROM COS		Actual 2023/2024				Proposed 2023/2024		0	
All rates include surcharges.		BASIC	ACCESS	MAXIMUM	ENERGY	BASIC	ACCESS	MAXIMUM	ENERGY
SEGMENT		CHARGE	DEMAND	DEMAND	CHARGE	CHARGE	DEMAND	DEMAND	CHARGE
Tariff Name	Code	R/C/m	R/kVA/m	R/A/m	R/kWh	R/C/m	R/kVA/m	R/A/m	R/kWh
3.A. Low voltage consumers (Tariff code	LLV	2 196.13	-	422.50	1.0440				
TOU TARIFFS		Basic	Access	Demand		Basic	Access	Demand	
	Basic: MD (Hi / Low): MD/Acc			-		134.55	9.63	-	
LLV	Energy: High: P/St/OP (R/kWh)					7.3397	2.3510	1.3607	
	Energy: Low: P/St/OP : R/kvarh					2.5175	1.7898	1.2021	
	Basic: MD (Hi / Low): MD/Acc	2 196.13	-	283.36		479.79	64.62	77.43	
LV	Energy: High: P/St/OP (R/kWh)	5.5494	1.6811	0.9127		6.4568	2.3921	1.5852	0.2644
	Energy: Low: P/St/OP : R/kvarh	1.8101	1.2457	0.7901	-	2.5277	2.5277	2.5277	
	Basic: MD (Hi / Low): Acc/MD	2 196.13	-	283.36		630.35	50.33	61.75	
MV	Energy: High: P/St/OP (R/kWh)	5.5494	1.6811	0.9127		6.3169	2.3402	1.5509	0.2644
	Energy: Low: P/St/OP : R/kvarh	1.8101	1.2457	0.7901		2.4729	1.8929	1.4244	

The ½ hourly load profile of all the profiles that were sent were analysed. The result of this analysis is illustrated in Table 60 for one customer.

Table 60

PR-11260036 (2023-10-06 TOU		ENERGY			DEMAND					TOTAL	TOTAL				
		P	S	O	MD - KVA ALL	MD - KW ALL	MD P&S	MD highest	MD highest	ENERGY	P&S	KVA LOAD FACTOR	P	S	O
MONTH	Days	kWh (for)	kWh (for)	kWh (for)	kVA	kW	kVA	kVA	kW	kWh (for)	kvarh	%	kWh (for)	kWh (for)	kWh (for)
2022/07/31	31	157 941	425 187	620 271	2 123.24	2 106.00	2 123.24	2 143	2 124	1 203 399	-	76.18%	13.12%	35.33%	51.54%
2022/08/31	31	145 908	387 918	497 907	2 074.69	2 052.00	2 063.34	2 143	2 124	1 031 733	281	66.84%	14.14%	37.60%	48.26%
2022/09/30	30	124 263	296 190	436 536	2 072.11	2 052.00	2 072.11	2 143	2 124	856 989	3	57.44%	14.50%	34.56%	50.94%
2022/10/31	31	126 072	306 162	498 897	2 072.11	2 052.00	2 072.11	2 143	2 124	931 131	3	60.40%	13.54%	32.88%	53.58%
2022/11/30	30	130 833	317 538	445 338	2 072.11	2 052.00	2 072.11	2 143	2 124	893 709	8	59.90%	14.64%	35.53%	49.83%
2022/12/31	31	117 243	301 743	480 987	2 072.11	2 052.00	2 072.11	2 143	2 124	899 973	5	58.38%	13.03%	33.53%	53.44%
2023/01/31	31	110 439	289 071	333 432	2 047.42	2 034.00	2 047.42	2 143	2 124	732 942	328	48.12%	15.07%	39.44%	45.49%
2023/02/28	28	139 662	328 203	478 107	2 049.55	2 034.00	2 049.55	2 143	2 124	945 972	36	68.68%	14.76%	34.69%	50.54%
2023/03/31	31	167 796	454 707	553 455	2 128.11	2 106.00	2 128.11	2 143	2 124	1 175 958	-	74.27%	14.27%	38.67%	47.06%
2023/04/30	30	127 998	337 149	563 112	2 105.38	2 088.00	2 105.38	2 143	2 124	1 028 259	8	67.83%	12.45%	32.79%	54.76%
2023/05/31	31	171 819	427 635	587 241	2 128.11	2 106.00	2 128.11	2 143	2 124	1 186 695	17	74.95%	14.48%	36.04%	49.49%
2023/06/30	30	174 267	430 047	579 969	2 143.44	2 124.00	2 143.44	2 143	2 124	1 184 283	-	76.74%	14.71%	36.31%	48.97%
TOTALS		1 694 241	4 301 550	6 075 252	25 088.39	24 858.00	25 077.04	2 143	2 124	12 071 043	689	64.29%	14.04%	35.64%	50.33%

The calculation of the revenue for each of the tariff components for each month is shown in

Table 61. This is done for each of the tariff options.

Table 61

PR-11260036 (2023-10-06 TOU	New TOU								
	Admin Charge	Network access charge:	Network demand charge:	Peak c/kWh	Standard c/kWh	Off-peak c/kWh	Reactive energy (c/kvarh)	Total	c/kWh
31-Jul-22	630.35	140 238	131 111	997 694	995 037	961 949	-	3 226 659	268
31-Aug-22	630.35	140 238	127 412	921 683	907 819	772 181	74	2 870 037	278
30-Sep-22	630.35	140 238	127 954	307 295	560 668	621 812	1	1 758 599	205
31-Oct-22	630.35	140 238	127 954	311 769	579 544	710 641	1	1 870 777	201
30-Nov-22	630.35	140 238	127 954	323 542	601 078	634 350	2	1 827 796	205
31-Dec-22	630.35	140 238	127 954	289 935	571 179	685 130	1	1 815 068	202
31-Jan-23	630.35	140 238	126 429	273 109	547 192	474 949	87	1 562 634	213
28-Feb-23	630.35	140 238	126 561	345 376	621 267	681 027	10	1 915 109	202
31-Mar-23	630.35	140 238	131 412	414 950	860 730	788 355	-	2 336 315	199
30-Apr-23	630.35	140 238	130 008	316 532	638 201	802 110	2	2 027 722	197
31-May-23	630.35	140 238	131 412	424 898	809 485	836 480	5	2 343 149	197
30-Jun-23	630.35	140 238	132 358	1 100 823	1 006 410	899 447	-	3 279 907	277
Total	7 564	1 682 860	1 548 517	6 027 606	8 698 610	8 868 431	182	26 833 771	222

This is then done for all customers. The results are shown in Table 62. It shows the following impact for each customer. There are 192 TOU consumers. The table shows the impact for the 50 consumers who's load profiles were provided. The names have been hidden for privacy.

- Old to New TOU

Negative (-) amounts shown reduction in bill and positive (+) amounts show increases.

Table 62

	+ INCREASE		IMPACT SUMMARY							
Voltage	**Old MD to new TOU**		**Old to New TOU**		Annual	Monthly				
Voltage	**Old MD to new**	%	**Old to New TOU**	Diff %	LF	LF	Energy cost	kWH	c/kWh	**Highest M**
MV	3 605 574	15.52%			49.5%	65.9%	23 594 648	12 071 043	195.46	2 786
MV			(1 818 940)	-10.50%	27.4%	47.2%	15 430 461	7 933 536	194.50	3 308
LV	(92 086)	-34.70%			4.8%	7.2%	70 604	26 255	268.91	63
MV	6 355 046	10.65%			47.3%	62.4%	57 509 923	30 234 435	190.21	7 303
LV			(12 584)	-2.86%	13.5%	20.0%	289 185	110 433	261.86	93
LV	(16 089)	-3.15%			15.1%	21.9%	346 923	131 427	263.97	100
LV	519 281	44.90%			36.2%	60.7%	1 436 107	565 731	253.85	178
LV	(35 256)	-32.74%			6.8%	11.5%	35 902	13 411	267.70	22
LV	(30 876)	-60.22%			2.7%	4.5%	4 410	1 803	244.63	8
LLV	(24 739)	-93.87%			#DIV/0!	#DIV/0!	-	-	#DIV/0!	-
LV			1 676 145	46.37%	35.2%	54.3%	4 493 812	1 759 082	255.46	571
LV	403 590	36.44%			31.5%	49.7%	1 249 726	489 814	255.14	177
LV			307 407	40.08%	29.5%	43.0%	873 398	343 089	254.57	133
LV			801 408	37.39%	34.0%	45.5%	2 466 839	961 229	256.63	323
LV	352 833	33.62%			37.2%	49.4%	1 187 622	461 871	257.13	142
LV	17 826	3.62%			18.5%	26.4%	376 220	144 007	261.25	89
LV	(54 639)	-15.17%			8.7%	14.9%	175 951	67 837	259.37	89
LV	(16 274)	-5.86%			14.2%	22.2%	179 529	68 945	260.40	56
LV	(63 899)	-5.90%			12.8%	19.3%	688 472	261 605	263.17	233
LV	54 370	13.84%			25.3%	34.9%	349 760	135 574	257.98	61
MV			(386 857)	-3.22%	20.4%	27.5%	8 908 245	4 133 850	215.50	2 314
LV	3 677	1.63%			21.8%	30.0%	170 529	67 061	254.29	35
LV	6 572	2.87%			2.3%	32.7%	185 221	72 073	256.99	355
LV	20 420	5.96%			20.2%	29.0%	272 048	104 017	261.54	59
LV	(21 418)	-41.16%			14.9%	20.4%	17 504	6 609	264.85	5
LV	(52 496)	-43.87%			5.7%	7.9%	29 741	11 121	267.42	22
LV	(28 509)	-64.33%			2.2%	4.0%	2 892	1 147	252.15	6
LV	(23 095)	-50.28%			11.7%	16.8%	11 048	4 359	253.48	4
LV	(15 578)	-3.54%			17.0%	23.6%	304 057	118 089	257.48	79
LV	(99 067)	-13.26%			2.3%	7.3%	219 123	80 075	273.65	402
LV			255 820	32.10%	31.5%	43.1%	869 017	333 904	260.26	121
LV	(30 956)	-11.39%			12.9%	18.5%	160 748	58 884	272.99	52
LV	(22 488)	-66.58%			4.6%	9.3%	2 529	1 022	247.44	3
LV	(23 821)	-59.84%			4.5%	9.0%	4 583	1 798	254.82	5
LV	(29 485)	-37.08%			10.2%	13.9%	27 674	10 196	271.43	11
LV	(30 510)	-51.22%			7.8%	10.5%	12 413	5 060	245.31	7
LV	634 439	22.61%			22.8%	34.4%	2 725 305	1 019 596	267.29	510
MV	646 046	6.51%			35.5%	46.9%	8 729 413	4 343 679	200.97	1 398
LV	22 015	4.18%			20.8%	28.0%	413 006	160 980	256.56	88
LV	(25 486)	-59.54%			6.6%	9.1%	5 930	2 225	266.53	4
LV	(18 551)	-15.26%			13.5%	20.2%	68 539	24 349	281.49	21
LV	(291 535)	-19.88%			10.2%	13.7%	716 942	273 314	262.31	304
LV	15 749	3.69%			17.1%	25.0%	315 822	119 107	265.16	79
LV	(895 704)	-67.27%			11.5%	18.2%	123 660	46 897	263.68	47
LV	147 996	26.50%			29.8%	42.1%	561 601	220 059	255.20	84
LV	338 060	29.23%			30.4%	42.0%	1 190 460	466 747	255.05	175
LV	(27 945)	-2.61%			17.1%	23.1%	748 678	295 098	253.70	197
LV	151 487	13.96%			24.3%	33.2%	968 611	379 780	255.05	178
LV	(25 583)	-64.76%			4.8%	7.1%	3 622	1 423	254.55	3
LV	(155 506)	-24.49%			9.6%	12.6%	275 137	107 649	255.59	128
LV	(27 699)	-53.17%			8.2%	11.0%	10 329	4 069	253.87	6
LV	39 612	5.33%			20.8%	27.1%	576 275	225 268	255.82	124
					#DIV/0!	#DIV/0!	-	-	#DIV/0!	-
-	11 155 304	7.26%	822 401	0.57%	34.6%	49.7%	139 390 193	68 480 630	203.55	22 562

These impacts differ from the COS results and proposed tariffs as shown in Table 63 below.

Table 63

CALCULATED REVENUE		2022/2023 Proposed	2022/2023 Reference	Difference	Structure change	Initial cost reflectiveness
Nr	TARIFF NAME	R/year	0.00%	Rand	%	
1	Bulk Industrial	64 140 908	53 036 074	11 104 834	20.94%	-10.0%
1	Bulk Industrial-Dept	6 147 557	7 315 284	-1 167 728	-15.96%	20.8%
1	Bulk Industrial mv	87 604 998	77 899 064	9 705 934	12.46%	-2.0%
1	Net Metering Industrial (for Approved SSEG)	-	-	-	#DIV/0!	0.0%
1	Bulk Time Of Use Tariff: Alternative	11 237 350	11 001 518	235 832	2.14%	5.4%
1	Bulk Time Of Use Tariff: Alternative MV	39 229 085	37 389 029	1 840 056	4.92%	3.3%

The ratio of energy consumption in the different TOU profiles were then analysed for the three different sources of data namely: the ½ hour profile data, the data from the billing reports and data from the bulk bills details that were provided. The results are shown in Table 64.

Table 64

From Profile data						
P	S	O				
9 983 604	26 150 119	32 346 907				
14.6%	**38.2%**	**47.2%**				
From Sales reports						
P	S	O	-	P	S	O
1 655 131	1 413 112	678 184		1 436 323	2 842 058	1 596 805
2 273 245	1 940 844	931 455	-	1 972 724	3 903 435	2 193 138
3 928 376	**3 353 956**	**1 609 639**	**-**	**3 409 047**	**6 745 493**	**3 789 943**
32.1%	**44.2%**	**23.6%**				

FROM BULK BILLS			
	P	S	O
All	1 670 928	3 524 830	1 045 015
Hi	1 225 303	1 680 464	285 470
Low	445 625	1 844 365	759 545
All	**26.8%**	**56.5%**	**16.7%**
Hi	38.4%	52.7%	8.9%
Low	14.6%	60.5%	24.9%

It is clear that the data differs significantly. The Sales report data is complete and considered the most accurate. The individual impact studies done here using the load profile data will thus be different but gives an idea of the type of consumer impacts.

The impacts are illustrated graphically in Figure 18 and
Figure 19.

Figure 18

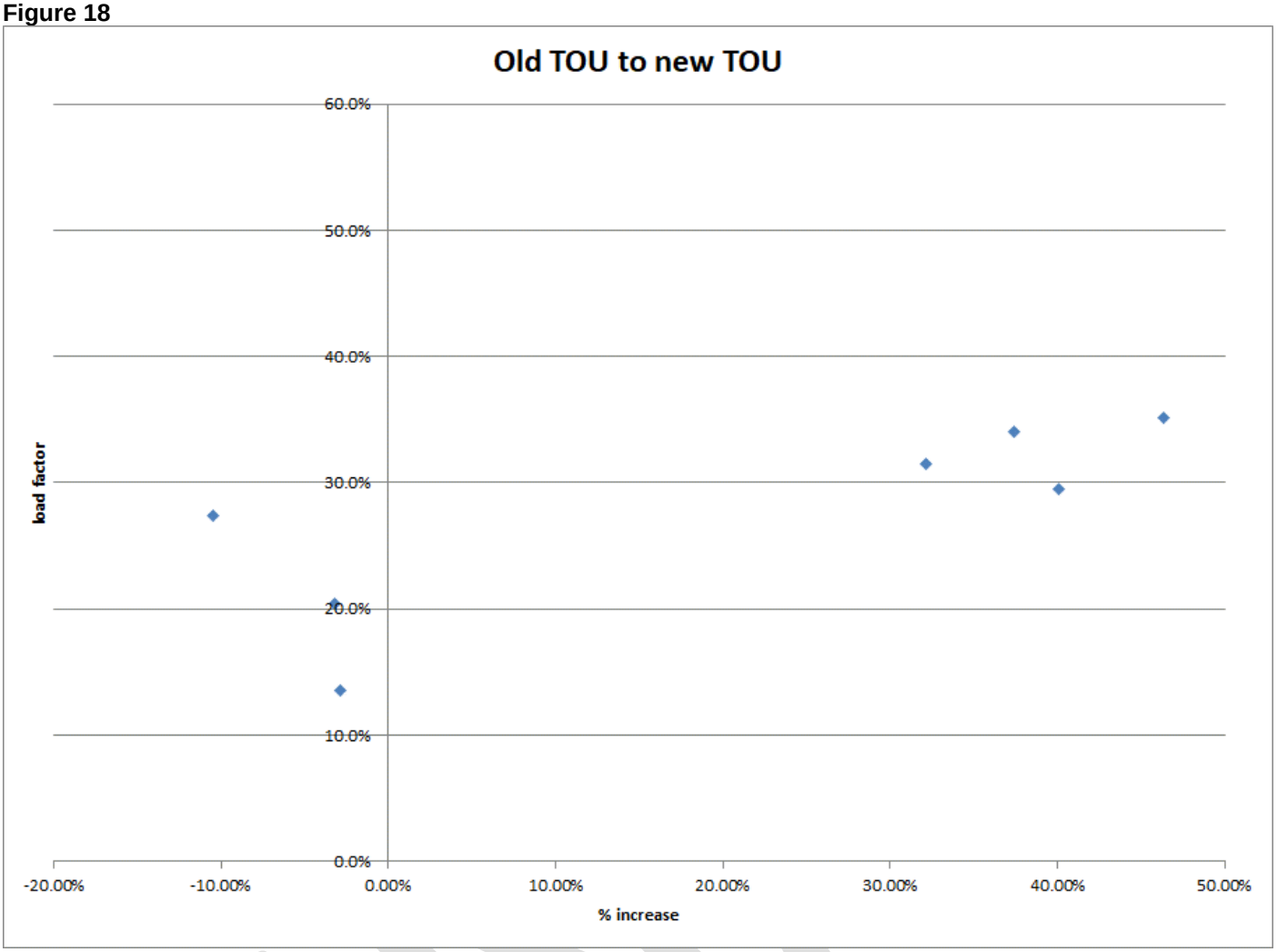
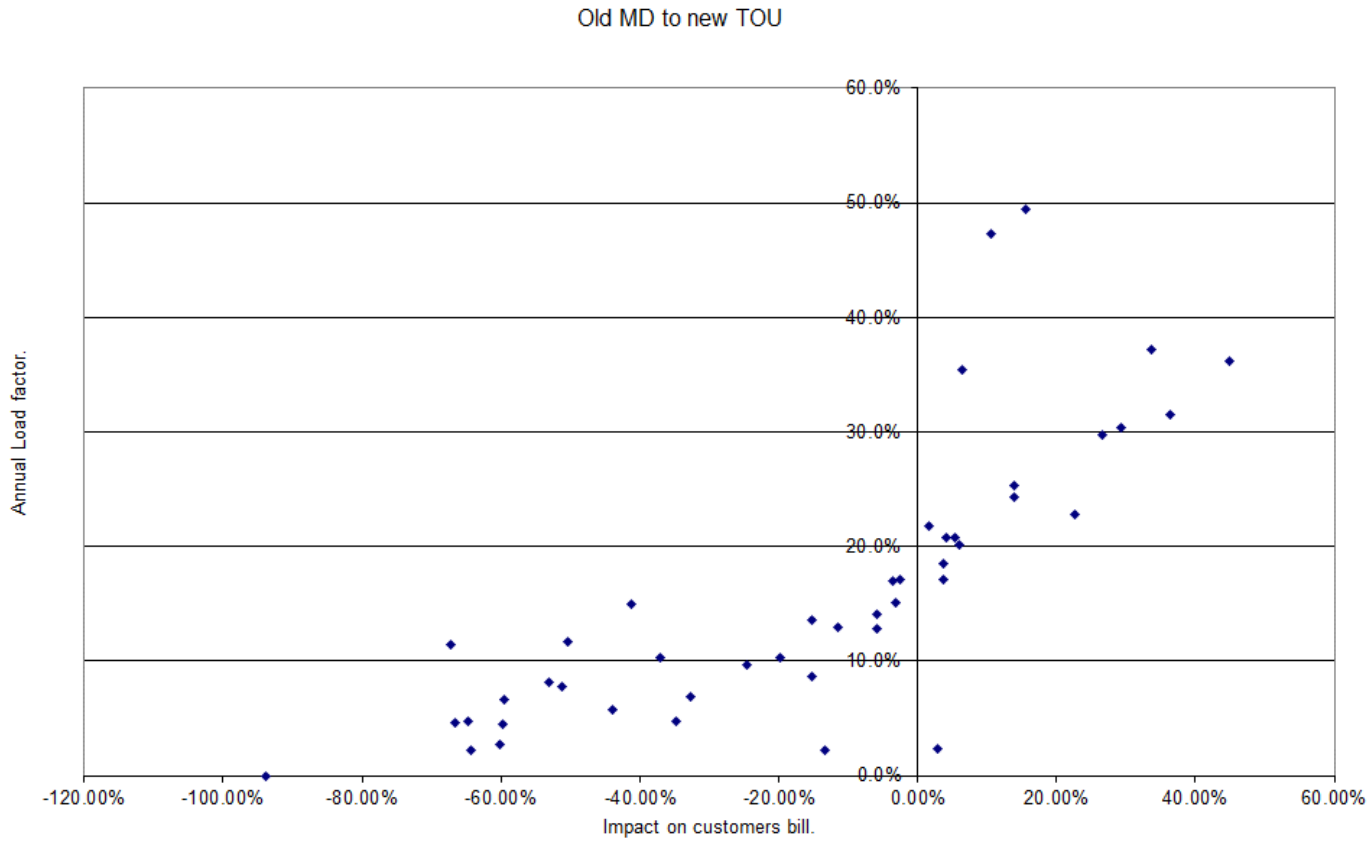


Figure 19



The main reason for the big savings for many of these consumers is because the current demand charges are too high and the energy rates are too low. Those customers with low load factors were thus heavily overcharged in the past.

19.2. TOU tariff recommendations

The following is thus proposed in this respect:

- The tariffs thus be developed based on the cost of supply results.
- The differentiation will be set as per cost differences.
- The markup on energy will be in R/kWh and not in %.
- A TOU tariff also needs to be created for small consumers.

The following realities have to be considered:

- Many bulk consumers do not have electronic meters installed.
- Few of the electronic meters are equipped with modems to enable remote reading.
- The current TOU billing is done by an official in Excel.
- The current TOU meters only store 3 months of load profile data.
- The current billing system is not set-up for TOU billing?

This situation is non-sustainable in view of the following:

- Errors can creep in which could take a long period of time before being detected, at least one month.
- If all Bulk consumers are moved to TOU the workload on the manual system will become problematic.
- If SSEG consumers are also equipped with 4 quadrant TOU meters and be charge and credited on a TOU tariff, the workload will become even worse.
- Bulk and SSEG consumers require quality services. This includes online meter by which they can log into the system and monitor their own consumption.

In view of the above the following is proposed:

- The terms of reference be compiled for an automatic meter reading (AMR) service provider to provide the required meters, modems and a metering / billing service.
- That a suitable service provider be contracted to provide such service.
- That the monthly cost of such service be charged to the Bulk consumers.
- That the billing system be set-up to integrate with the AMR service provider system to ensure smooth data transfer.

As an interim measure TOU can be offered to Bulk consumers if meters are already installed or they are willing to pay for such meter if one is not installed. This could be considered unfair. These practical issues need to be considered in deciding at what speed TOU should be implemented. In the first round all consumers at MV should be converted to TOU.

20. SMALL SCALE EMBEDDED GENERATION (SSEG)

The important issue in respect of SSEG customers is that they must be on a cost reflective tariff with fixed and capacity / demand charges close to cost.

Ideally all SSEG consumers should be on a TOU tariff with 4 quadrant meters:

- A new TOU tariff for small consumers, <100 kVA, has been developed.
- Any consumer can select this tariff, but all SSEG consumers must be on this tariff.
- It is subject to an application and payment for the supply and installation of a 4 wire, 4 quadrant TOU meter.
- The tariff has been designed as follows:
    - The basic charge equal to the average of a 1 and 3 phase TOU meter supply.

- The capacity charge is set at the average of the Domestic and Commercial tariff capacity charge.
- The energy rates are set equal to the Bulk LV plus the additional losses on the LV network.
- No reactive energy charge is levied

The SSEG Feed-in tariff, which caters for consumers who want to feed-in to the network, is as follows:

- An additional basic charge to cater for the additional metering & administration costs to administer the feed-in.
- The energy credit rates are set at 90% of Eskom Megaflex TOU energy rates (excluding the non-TOU energy rates) applicable to Swartland.
- This tariff applies to any customer wanting to feed-in irrespective of whether they have a LV or MV connection.
- Various other conditions apply.

Realistically the municipality does not currently have the resources to manage many electronic meters. An alternative option is as follows:

- SSEGS consumers pay the standard domestic tariff plus the additional SSEG basic charge.
- The energy charge for consumption remains the same.
- The export tariff be set as a single energy rate.
- The standard Ferraris disc meters cannot be used as these meters turn backwards when any energy is exported. The consumer will thus at least have to pay for any electronic meter that will block / not record any export energy.
- These consumers must at least take a 30 Amp supply.

It is realised that many SSEG consumers use very little energy. In terms of the current industry accepted norm consumers can only export so much energy as the value of their energy consumed. This seriously limits any exports. The City of Cape Town has obtained approval from NERSA to buy more than the value of what the consumer buys from National Treasury.

The potential to buy massive amounts of energy from SSEG consumers is very real. It is therefore proposed that the TOU option with 4 quadrant meters be the preferred way to address these consumers. In terms of managing the electronic meters with remote access it is strongly proposed that an external contractor be appointed to do this management. The additional cost can be the basis for the additional SSEG basic charge and thus it would not have a negative financial impact on the municipality.

No export profile quantities were obtained from the municipality. The average c/kWh rate can thus not be calculated. The proposed rates for the TOU for Small consumers and the SSEG feed-in tariff are shown in Table 65 below.

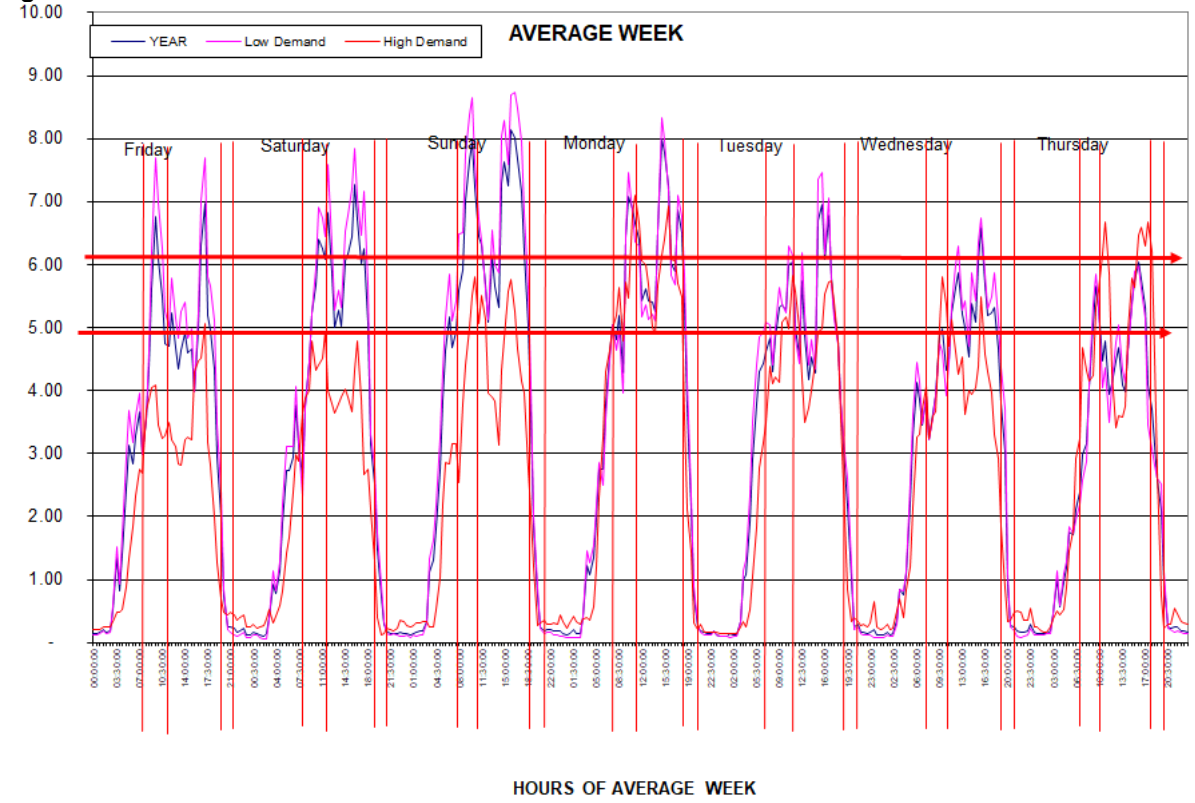
Table 65

SSEG export (customer on stanrd TOU tariff)			
Addisional Admin Charge per Month (to Off-Taker)			R100.00
Export credit (if not on TOU)			R1.2500
TOU Low season Export credit (on TOU) 80%			
Peak (kWh)			R1.3549
Standard (kWh)			R0.9633
Off peak (kWh)			R0.6470
TOU High season Export credit (on TOU) 80%			
Peak (kWh)			R3.9502
Standard (kWh)			R1.2653
Off peak (kWh)			R0.7323

Financial Impact.

An analysis was then done to determine what the financial impact when SSEG consumers reduce their consumption and when they export into the network. The process starts with an analysis of the load profiles namely: Normal domestic, SSEG import and SSEG export. The half hourly profile of the 52 weeks of SSEG export power is shown in the Figure 20 below.

Figure 20



The key quantities are shown Table 66 below.

Table 66

Dom		ENERGY			DEMAND					TOTAL	TOTAL				
		P	S	O	MD - KVA ALL	MD - KW ALL	MD P&S	MD highest	MD highest	ENERGY	P&S	KVA LOAD FACTOR	P	S	O
MONTH	Days	kWh (for)	kWh (for)	kWh (for)	kVA	kW	kVA	kVA	kW	kWh (for)	kvarh	%	kWh (for)	kWh (for)	kWh (for)
2022/07/31	31	141 729	402 663	484 459	3 473.22	3 473.20	2 703.07	3 789	3 789	1 028 851	9	39.82%	13.78%	39.14%	47.09%
2022/08/31	31	140 649	435 719	425 445	3 471.13	3 471.12	3 471.13	3 789	3 789	1 001 814	1	38.79%	14.04%	43.49%	42.47%
2022/09/30	30	151 021	359 327	386 605	3 707.93	3 707.92	3 305.22	3 789	3 789	896 953	57	33.60%	16.84%	40.06%	43.10%
2022/10/31	31	145 904	344 028	423 584	3 715.78	3 715.76	3 030.43	3 789	3 789	913 516	47	33.04%	15.97%	37.66%	46.37%
2022/11/30	30	152 737	335 360	384 946	3 714.66	3 714.64	3 044.52	3 789	3 789	873 044	40	32.64%	17.49%	38.41%	44.09%
2022/12/31	31	135 976	327 119	433 030	3 707.93	3 707.92	3 042.03	3 789	3 789	896 125	59	32.48%	15.17%	36.50%	48.32%
2023/01/31	31	157 744	348 337	405 284	3 069.05	3 069.04	3 032.44	3 789	3 789	911 364	41	39.91%	17.31%	38.22%	44.47%
2023/02/28	28	138 193	318 315	367 707	3 713.70	3 713.68	2 989.54	3 789	3 789	824 215	42	33.03%	16.77%	38.62%	44.61%
2023/03/31	31	153 547	361 948	403 128	3 707.93	3 707.92	3 015.78	3 789	3 789	918 623	29	33.30%	16.71%	39.40%	43.88%
2023/04/30	30	112 177	283 840	441 777	3 474.00	3 474.00	3 474.00	3 789	3 789	837 794	143	33.49%	13.39%	33.88%	52.73%
2023/05/31	31	137 010	355 014	405 422	3 789.15	3 789.12	3 543.45	3 789	3 789	897 446	278	31.83%	15.27%	39.56%	45.18%
2023/06/30	30	144 440	466 067	454 904	3 713.30	3 713.28	3 713.30	3 789	3 789	1 065 411	33	39.85%	13.56%	43.75%	42.70%
TOTALS		1 711 128	4 337 738	5 016 292	43 257.77	43 257.60	38 364.91	3 789	3 789	11 065 157	777	33.34%	15.46%	39.20%	45.33%

SSEG Imp		ENERGY			DEMAND					TOTAL	TOTAL				
		P	S	O	MD - KVA ALL	MD - KW ALL	MD P&S	MD highest	MD highest	ENERGY	P&S	KVA LOAD FACTOR	P	S	O
MONTH	Days	kWh (for)	kWh (for)	kWh (for)	kVA	kW	kVA	kVA	kW	kWh (for)	kvarh	%	kWh (for)	kWh (for)	kWh (for)
2022/07/31	31	2 009	7 344	3 053	64.01	63.86	64.01	69	69	12 407	8	26.05%	16.20%	59.19%	24.61%
2022/08/31	31	2 064	7 869	3 000	64.62	64.44	64.62	69	69	12 934	21	26.90%	15.96%	60.85%	23.19%
2022/09/30	30	2 378	7 122	2 804	69.14	68.90	69.14	69	69	12 304	19	24.72%	19.32%	57.89%	22.79%
2022/10/31	31	2 282	7 056	3 178	69.14	68.90	69.14	69	69	12 515	18	24.33%	18.23%	56.38%	25.39%
2022/11/30	30	2 481	7 395	2 712	69.14	68.90	69.14	69	69	12 589	15	25.29%	19.71%	58.74%	21.55%
2022/12/31	31	2 263	7 184	3 706	69.14	68.90	69.14	69	69	13 153	16	25.57%	17.21%	54.62%	28.17%
2023/01/31	31	2 453	7 608	2 939	69.14	68.90	69.14	69	69	13 000	15	25.27%	18.87%	58.53%	22.60%
2023/02/28	28	2 286	6 934	2 736	62.11	61.94	62.11	69	69	11 956	13	28.65%	19.12%	58.00%	22.89%
2023/03/31	31	2 516	7 658	3 051	69.14	68.90	69.14	69	69	13 225	16	25.71%	19.02%	57.91%	23.07%
2023/04/30	30	1 908	5 867	4 219	69.14	68.90	69.14	69	69	11 994	14	24.10%	15.91%	48.92%	35.17%
2023/05/31	31	2 330	6 882	2 873	62.63	62.35	62.63	69	69	12 085	21	25.94%	19.28%	56.95%	23.78%
2023/06/30	30	2 135	7 543	3 194	61.94	61.78	61.94	69	69	12 873	6	28.86%	16.59%	58.60%	24.81%
TOTALS		27 106	86 464	37 465	799.27	796.67	799.27	69	69	151 034	184	24.94%	17.95%	57.25%	24.81%

SSEG Exp		ENERGY			DEMAND					TOTAL	TOTAL				
		P	S	O	MD - KVA ALL	MD - KW ALL	MD P&S	MD highest	MD highest	ENERGY	P&S	KVA LOAD FACTOR	P	S	O
MONTH	Days	kWh (for)	kWh (for)	kWh (for)	kVA	kW	kVA	kVA	kW	kWh (for)	kvarh	%	kWh (for)	kWh (for)	kWh (for)
2022/07/31	31	222	785	736	14.28	6.29	14.28	21	7	1 742	1 040	16.40%	12.74%	45.05%	42.21%
2022/08/31	31	297	1 032	907	20.59	7.42	19.31	21	7	2 236	1 854	14.60%	13.30%	46.13%	40.56%
2022/09/30	30	303	958	876	19.57	7.22	19.57	21	7	2 137	1 202	15.17%	14.16%	44.83%	41.00%
2022/10/31	31	306	1 003	1 028	19.35	7.22	19.35	21	7	2 337	1 208	16.24%	13.09%	42.91%	44.00%
2022/11/30	30	329	1 042	923	19.57	7.22	19.57	21	7	2 294	1 464	16.28%	14.34%	45.44%	40.22%
2022/12/31	31	300	1 016	1 058	19.57	7.22	19.57	21	7	2 374	1 354	16.31%	12.63%	42.79%	44.57%
2023/01/31	31	324	1 083	998	19.57	7.22	19.57	21	7	2 405	1 522	16.52%	13.47%	45.04%	41.48%
2023/02/28	28	311	994	912	19.57	6.84	19.57	21	7	2 218	1 389	16.87%	14.05%	44.82%	41.13%
2023/03/31	31	334	1 059	960	19.57	7.22	19.57	21	7	2 353	1 348	16.17%	14.21%	45.00%	40.79%
2023/04/30	30	252	832	1 135	19.57	7.22	19.35	21	7	2 219	1 088	15.75%	11.35%	37.50%	51.15%
2023/05/31	31	307	936	880	19.35	7.09	19.35	21	7	2 123	971	14.75%	14.45%	44.09%	41.46%
2023/06/30	30	221	677	733	13.55	6.00	13.55	21	7	1 630	605	16.71%	13.54%	41.54%	44.93%
TOTALS		3 506	11 417	11 145	224.07	84.18	222.58	21	7	26 069	15 044	14.46%	13.45%	43.80%	42.75%

The effective cost at Megaflex energy rates are then calculated as shown Table 67 below.

Table 67

Dom	New TOU								
	Admin Charge	Network access charge:	Network demand charge:	Peak c/kWh	Standard c/kWh	Off-peak c/kWh	Reactive energy (c/kvarh)	Total	c/kWh
31-Jul-22	-	-	-	953 499	867 523	603 963	-	2 424 985	236
31-Aug-22	-	-	-	946 232	938 741	530 392	-	2 415 365	241
30-Sep-22	-	-	-	348 418	589 320	425 761	-	1 363 499	152
31-Oct-22	-	-	-	336 611	564 229	466 485	-	1 367 325	150
30-Nov-22	-	-	-	352 377	550 014	423 934	-	1 326 324	152
31-Dec-22	-	-	-	313 708	536 497	476 888	-	1 327 093	148
31-Jan-23	-	-	-	363 927	571 296	446 331	-	1 381 554	152
28-Feb-23	-	-	-	318 821	522 058	404 949	-	1 245 828	151
31-Mar-23	-	-	-	354 245	593 619	443 957	-	1 391 821	152
30-Apr-23	-	-	-	258 801	465 517	486 521	-	1 210 839	145
31-May-23	-	-	-	316 092	582 247	446 484	-	1 344 823	150
30-Jun-23	-	-	-	971 738	1 004 124	567 117	-	2 542 979	239
Total	-	-	-	5 834 468	7 785 184	5 722 783	-	19 342 436	175

SSEG Imp	New TOU								
	Admin Charge	Network access charge:	Network demand charge:	Peak c/kWh	Standard c/kWh	Off-peak c/kWh	Reactive energy (c/kvarh)	Total	c/kWh
31-Jul-22	-			13 519	15 822	3 807	-	33 148	267
31-Aug-22	-			13 889	16 955	3 740	-	34 583	267
30-Sep-22	-			5 485	11 681	3 088	-	20 254	165
31-Oct-22	-			5 264	11 572	3 499	-	20 335	162
30-Nov-22	-			5 725	12 128	2 987	-	20 840	166
31-Dec-22	-			5 222	11 783	4 081	-	21 086	160
31-Jan-23	-			5 660	12 478	3 236	-	21 374	164
28-Feb-23	-			5 274	11 372	3 013	-	19 659	164
31-Mar-23	-			5 804	12 560	3 360	-	21 723	164
30-Apr-23	-			4 402	9 623	4 646	-	18 671	156
31-May-23	-			5 375	11 287	3 164	-	19 826	164
30-Jun-23	-			14 366	16 252	3 982	-	34 600	269
Total	-	-	-	89 983	153 513	42 603	-	286 099	189
						19.4		90 620	60
								195 479	

SSEG Exp	New TOU								
	Admin Charge	Network access charge:	Network demand charge:	Peak c/kWh	Standard c/kWh	Off-peak c/kWh	Reactive energy (c/kvarh)	Total	c/kWh
31-Jul-22	-	-	-	1 493	1 691	917	-	4 101	235
31-Aug-22	-	-	-	2 001	2 223	1 131	-	5 355	239
30-Sep-22	-	-	-	698	1 571	965	-	3 234	151
31-Oct-22	-	-	-	706	1 645	1 132	-	3 483	149
30-Nov-22	-	-	-	759	1 709	1 016	-	3 485	152
31-Dec-22	-	-	-	692	1 666	1 165	-	3 524	148
31-Jan-23	-	-	-	748	1 777	1 099	-	3 623	151
28-Feb-23	-	-	-	719	1 630	1 005	-	3 353	151
31-Mar-23	-	-	-	771	1 737	1 057	-	3 566	152
30-Apr-23	-	-	-	581	1 364	1 250	-	3 195	144
31-May-23	-	-	-	708	1 535	969	-	3 212	151
30-Jun-23	-	-	-	1 485	1 459	913	-	3 857	237
Total	-	-	-	11 360	20 008	12 620	-	43 988	169

The impacts on the various cases are shown in Table 68 below:

Table 68

PV IMPACTS				
ENERGY BLOCKS	**Charges**	**Domestic Cost**	**Plus losses**	**Markup**
(0-50) kWh	1.602352	1.75	1.89	-0.28765
(51-350) kWh	2.060292	1.75	1.89	0.170292
(351-600) kWh	2.899585	1.75	1.89	1.009585
(>600) kWh	3.41466	1.75	1.89	1.52466
Lost revenue	**Charges**	**SSEG cost**	**Plus losses**	**Markup**
(>600) kWh	3.41466	1.89	2.0412	1.37346
Saving in purchase	**Export credit**	**SSEG export value**	**Plus losses**	**Markup**
All	1.352	1.69	1.8252	0.4732

The following conclusions can be made from this:

- With the current tariffs the lost revenue when SSEG consumers reduce energy in the last 2 blocks is R1 and R1,5 respectively. The correct markup should be about a 1/3 of this.
- The cost of supplying energy to an SSEG consumer is about 14 c/kWh more than for a normal domestic consumer. This is because of more expensive usage during the peak periods.
- The savings when purchasing export energy at 80% of average savings at R1.35 is 47 c/kWh.

The normal markup should be as shown below:

- The energy Tariff markup is typically:
  - 15% surplus.
  - 8% losses.
  - Cross subsidy 5%
  - Total 28%
  - 28% * 175 c/kWh = about 49 c/kWh

Thus if the feed-in rate is too low consumers will simply shift load from the evening to the day when they have surplus energy. That will mean that for every kWh shifting a significant net revenue would be lost. The key point to note is that if enough export power can be purchased from consumers the total revenue lost can be made up through savings in purchase cost.

In view of the limited data it is proposed that as interim measure an export credit of **R1.20**/kWh be applied.

21. WHEELING

The wheeling of power over municipal networks are now widely accepted and starting to be applied in many municipalities. The following should be understood in this respect:

- There is the potential to loose revenue, but it can be overcome with the application of the correct wheeling policy and charges.
- The potential benefit of wheeling is that municipal consumers can contract with an IPP by which it can purchase energy at a lower cost thus making it more viable.
- The alternative to wheeling is for the municipality to rather contract with IPPs so as to reduce its purchase costs. In this case the benefit will be to the benefit of all municipal consumers.
- It must be realised that the potential for renewable power, especially PV power, injection into the network is limited. During the middle of the day when the sun is shining, and PV generation is at its maximum the amount of load on the network is not that high as can be seen from the Swartland profiles.
- The municipality must thus manage the approval of wheeling and own IPP power within the limits of the current loads and network capacity. In some cases, loads can be shifted to other networks but that would usually be complex.

- The amount of installation of consumer own generation, SSEG, will reduce the load during the day even more thus exaggerating this challenge. Great care must thus be taken in this respect.
- Currently the total network costs are covered by consumers through the Maximum demand, access and partly energy charges. When IPPs enter the market the loads to consumers remain the same, thus the loading on the networks will in most cases reduce, at the higher voltage networks to where the IPP is connected.
- It is thus incorrect to charge IPPs a demand or access charge in respect of the amount of power to be injected into the network as it is already paid.
- It is also important to realise that any wheeling agreement does not relate to the actual flow of energy, kWh. An IPP can thus be connected to a network in Malmesbury and contract with a consumer in Moorreesburg. As long as the power exported can be accommodated in that network.
- It is also important to realise that an IPP can either be embedded in the municipal network or be outside of the municipal network and power (net necessary kWh) flow through the Eskom meter.

In view of the above the following policy is proposed:

Swartland municipality accepts wheeling of IPP power to its own consumers on the basis provided here.

- Only NERSA licenced / registered generators will be allowed to wheel.
- The allocation of IPP / wheeling capacity will be done to ensure that competitive a market will prevail, and lowest possible prices can be achieved and the best deal for its consumers.
- 1 MVA maximum export capacity allocation will be allowed per applicant. (if it is an existing customer)
- The generator cannot be a SSEG exporter and a wheeler at the same time
- The minimum connection size of the off taker / end user must be at least 3 x 80 Amps = 55 kVA
- The off taker must be on TOU tariff minimum 3x80 Amps.
- A use of system agreements have to be signed by the IPP and off-taker.
- The tariffs must be at least surplus (lost revenue – cost savings) neutral for the municipality. Any additional charges for wheeling added by Eskom to the municipality's account will be for the off taker's account.
- The off taker must be approved by the municipality and the off-takers supply agreements must be amended.
- Off takers may not be in debt to the municipality
- The billing will be reconciled on 30-minute periods.
- No energy `banking will be allowed. This means that any kWh wheeled which exceed the power consumed by the off taker in any ½ hour period will be considered over wheeling. This means that the municipality will receive this energy free of charge,
- Any off taker may not receive any electrical energy from more than one RPPS.
- Preference will be given to embedded generators connected to the municipal network
- It is noted that Virtual Wheeling, as contemplated by Eskom with national companies, will not impact the municipality and no amendment/agreement between the IPP and the embedded off-taker and the municipality will be required.

The billing will thus be done as follows:

Two generic methods are being applied and considered for the industry:

1. Charge the off-taker the standard municipal bill plus wheeling charge and credit the consumer for the wheeled energy.
2. Charge consumer the standard municipal bill plus wheeling charge but in respect of energy the following:
    a. The standard price for energy provided by the municipality per half hour period.
    b. A wheeling charge in c/kWh in respect of the wheeled energy.

In both cases the method can be revenue neutral. Method 1 is proposed and described below.

21.1. Municipal Grid connected Generator:

Eskom bill to the Municipality:

- Eskom's bill will automatically reduce because less energy will flow from Eskom to the municipality as the energy will be generated by the Generator connected after the Eskom meter. (This is valid only if the energy is not generated prior to the wheeling arrangement taking effect)
- The amount of energy reduction in the Eskom bill will include the reduction in the losses as the flow of energy through the networks closest to the Eskom supply will reduce.
- There will however not be a clear adjustment in the Eskom bill, the consumption quantities will simply be lower.

Generator Bill.

- The generator will be billed for the standard Municipal applicable TOU tariff charges including
    - Standard Basic charge
    - Plus wheeling basic charge.
    - Demand and Access charges in respect of:
        - the maximum capacity it wants to take from the Grid and based on the actual demand used
        - or in cases where the network capacity is exceeded based on the wheeling demand.
- The generator will pay for any energy used at the standard energy charges but will not be credited for any energy wheeled.

The Off taker

- The bill at the standard tariff applicable to the off taker (in time on TOU) will be the same as before the wheeling and thus firstly reflect all the energy going through the off-taker meter.
- An additional Basic charge will be levied to cover the additional costs relating to the implementation of the wheeled energy approach of the off-taker.
- An energy credit will be applied for the wheeled energy at the Eskom Megaflex TOU energy charges minus losses (at the budgeted rate) (excluding ancillary service charges and rural electrification subsidies) as applied to the Municipality by Eskom to the network where the consumer is connected.
    - The energy credit will reflect:
        - the total kWh wheeled and consumed by the off-taker during every half hour.
        - excluding the amount of kWh wheeled which exceed the amount consumed during every half hour period. (over wheeled energy).
- No credit is applied in respect of demand and access charges.

21.2. Municipal Grid connected Generator wheeling to Eskom consumer:

This will not be allowed. The main reason is because such generator will be using the capacity available on the Municipal Grid to install generators to benefit Municipal consumers.

21.3. Eskom connected Generator:

Eskom bill to the Municipality:

- Eskom will charge an additional basic charge for wheeling to the generator.
- Eskom will credit the account by the amount of wheeled energy as provided by the generator at the TOU energy charges of the Eskom WEPS tariff but not in respect of:
    - The losses factor.
    - Ancillary service charge and electrification and rural subsidy charge.
    - No adjustments in Maximum Demand or Access charges.

Generator Bill.

- Eskom will charge the Generator.

The Off taker

- The bill at the standard tariff applicable to the off-taker (in future on TOU) will be the same as before the wheeling and thus firstly reflect all the energy going through the off-taker meter at the standard tariff.
- Two additional Basic charges will be levied to cover the additional costs relating to the wheeling:
    - The municipal wheeling Basic charge.
    - The Eskom wheeling basic charge.

- An energy credit for the wheeled energy will be the same as that by which Eskom credits the account to the Municipality. (WEPS TOU energy rate excluding losses)
- NB!!! When power is wheeled by an Eskom connected generator our system losses will not reduce. This means that the amount of energy that actually reaches the off-taker will be less than that which is wheeled by the Generator. Should the losses not be deducted. This could mean that a customer will be credited with more kWh than that actually used.
- These amounts will be per TOU period and will not be reconciled per half hour period but per month.
- In cases where there is over wheeling in any TOU period, the benefit will be for the Municipality. No banking will also be allowed between the different TOU periods.

22. ONLINE VENDING

Currently prepaid consumers can only purchase directly from the various Swartland vending points. There is a big need for consumers to be able to buy their pre-paid power online. The following facts should be considered in this respect:

- Currently the municipality pays the vending company a commission based on the sales value in Rand. R1.37 mill / y divided by R92 mill = 1.5%.
- The total amount is R1.37 mill per year for 14 000 consumers which equal to R8.16/consumer / month.

The various rates are calculated in Table 69.

Table 69

VENDING COST ANALYSIS	PP rev	Commission	Transaction	Vending cost	kWh	Consumers	% of rev	R/cons/m	R/kWh
Current vending cost	R 92 098 193			R 1 371 971	45673681.2	14378	1.49%	R 7.95	R 0.030
Online	R 92 098 193	R 2 118 258	R 7 775	R 2 126 033	45673681.2		2.30%		
High usage consumer	**kWh/m**			**Rev**	**Comm**	**Comm/kWh**	**Comm/cons/m**		
1	300			R 901.869	R 13.435	R 0.045	R 13.435		
2	600			R 1 870.529	R 27.865	R 0.046	R 27.865		
3	1000			R 3 179.888	R 47.370	R 0.047	R 47.370		
Thus addisional cost				R 754 063	R/kwh				
As % of pre-paid sales		Total sales rev	Sale kWh	0.82%	R 0.0165				
As % of Total revenue		R 377 258 758	169145445.4	0.20%	R 0.0045				

The question thus is how to recover this additional expenditure:

- Option 1. Recover as an additional % or c/kWh charge for pre-payment consumers.
  - This is problematic as many consumers will not use online vending and would thus object legitimately.
  - This is also problematic as the objective is to make conventional and pre-paid tariffs the same.
- Option 2. Recover an additional charge when consumer pay online. This would be fair and could also allow for conventional consumers who want to pay their bills online. This should be set equal to the % charged by the Bank – minus that saved on normal vending.
- Option 3. Because this is such a small % of total revenue is to absorb this additional cost.

The municipality need to make a decision in this respect. Before making the decisional the quote from the bank need to be updated.

23. PHASE IN

It is accepted that the proposed tariff structure changes will have a marked impact on customers. Some customers will pay much less and others much more. For this reason, the possibility to phase the changes in evenly over 3 years could be considered. This can be done as follows:

- Calculate the difference between the current charge and the proposed charge. (basic, Amp, R/kVA, energy).
- Divide the difference by 3 and add to the current charge.
- Then add annual price increase %.
- In year two add 1/3 of the difference and year three the full difference.

- Continue this trend to the end of the 3 year phase in.
- In some cases, combine different tariffs to reduce the total number.

This phase in plan has many difficulties:

Domestic.

- Consumers who are on pre-paid tariffs will now have different tariffs to those on conventional meters until end of phase-in.
- This means that there will still be 5 different domestic tariffs until end of phase in:
    - Indigent
    - Alternative <20 Amp.
    - Pre-paid non-indigent
    - Normal domestic.
    - SSEG.
- Policies thus need to be developed how to handle requests to convert all customers to alternative tariffs during the phase in period.

Commercial

- Three commercial tariffs will also exist:
    - Alternative 15 Amps.
    - Pre-paid
    - Standard conventional
    - SSEG.

Bulk.

- Four Bulk tariffs will exist during the phase in period:
    - Old Non-TOU LV now Semi TOU
    - Non-TOU MV now semi TOU
    - TOU-LV and MV
    - TOU- MV

All of this will require careful administration.

The following is proposed for implementation with no phase in:

- All SSEG consumer go to the full cost reflective tariffs.
- Streetlight tariff.

Implementation without phase in would have been proposed if it was not for the big negative impact of Bulk consumers on non-TOU tariffs at LV.

The fully phased in rates before any annual increases are shown in Table 70 below.

Table 70

SWARTLAND		20223/2024 Proposed after increase										
1		Phase in year 1	1	Increase	11.12%	Phase in years		3	Eskom Increase	0.00%		
1						Energy Peak	Energy Standard	Energy Off-Peak	Energy Peak	Energy Standard	Energy Off-Peak	Reactive energy
PROPOSED TARIFFS		Basic charge	Capacity	MD / kVA	ALL Energy	Block 1 energy	Block 2 energy	BLock 3 energy	BLock 4 energy	BLock 5 energy		
Nr	TARIFF NAME	Rand/month	R/kVA/A/m	R/kVA/A/m	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh	R/kWh
1	Pre-paid meter system (Indigent Residential)	-	-	-		-	2.1410	3.0524	3.6684	-	-	-
1	Households Alternative <20 Amp:-	-	-	-		2.1410	2.1410	3.0524	3.6684	-	-	-
1	Pre-paid Meter System (Non-Indigent Residential)	24.85	2.50	-		2.974	3.271	-	-	-	-	-
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	260.19	2.50	-		1.934	2.274	2.895	3.277	-	-	-
1	Residential Consumers (Houses, Flats & Farms) Network charge pe	260.19	2.50	-		1.934	2.274	2.895	3.277	-	-	-
1	Net Metering Residential (for Approved SSEG Households)	74.55	7.51	-	-	8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Commercial Pre-paid:-	35.25	4.63	-	3.439	-	-	-	-	-	-	-
1	Commercial Alternative < 15 AMP:-	-	-	-	4.157	-	-	-	-	-	-	-
1	Commercial Alternative < 15 AMP:-Dept	-	-	-	4.157	-	-	-	-	-	-	
1	Commerce / Non Standard (per kWh)	35.25	15.68	-	2.777	-	-	-	-	-	-	-
1	Commerce / Non Standard (per kWh)-Dept	35.25	15.68	-	2.777	-	-	-	-	-	-	-
1	Commerce Basic < 20KVA (Basic per month)	633.84	4.63		2.777	-	-	-	-	-	-	-
1	Commerce Basic < 20KVA (Basic per month)-Dept	633.84	4.63	-	2.777	-	-	-	-	-	-	-
1	Commerce Basic 20 to 40 KVA (Basic per month)	822.61	4.63	-	2.777	-	-	-	-	-	-	-
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	822.61	4.63	-	2.777	-	-	-	-	-	-	-
1	Commerce Basic >40 KVA (Basic per month)	1 472.25	4.63	-	2.777	-	-	-	-	-	-	-
1	Commerce Basic >40 KVA (Basic per month)-Dept	1 472.25	4.63	-	2.777	-	-	-	-	-	-	-
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	106	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	106	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	106	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Sports Grounds including maintenance of Floodlighting:-	-	-	-	3.92	-	-	-	-	-	-	-
1	Bulk Industrial	1 804.61	23.93	341.67		3.1650	1.6594	1.3605	1.7097	1.4901	1.3127	0.0979
1	Bulk Industrial-Dept	1 804.61	23.93	341.67		3.1650	1.6594	1.3605	1.7097	1.4901	1.3127	0.0979
1	Bulk Industrial mv	1 860.37	18.64	335.86		3.1132	1.6402	1.3478	1.6894	1.4745	1.3010	0.0979
1	Net Metering Industrial (for Approved SSEG)	1 826.83	23.93	341.67		3.1650	1.6594	1.3605	1.7097	1.4901	1.3127	0.0979
1	Bulk Time Of Use Tariff: Alternative	1 804.61	23.93	238.60		6.5026	2.1314	1.2633	2.2772	1.6395	1.1246	0.0979
1	Bulk Time Of Use Tariff: Alternative MV	1 860.37	18.64	232.79		6.4507	2.1121	1.2506	2.2569	1.6240	1.1129	0.0979
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	1 826.83	23.93	238.60		8.2069	2.6288	1.5215	2.8149	2.0013	1.3441	0.2938
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	105.75	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	105.75	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	105.75	13.88	-		8.5002	2.7227	1.5758	2.9155	2.0728	1.3922	0.2938
1	Streetlights - Internal Tariff	49.37	-	-	4.26	-	-	-	-	-	-	-
1	Wheeling Charges:	370.40	1 626.89	209.92	-	-	-	-	-	-	-	-
1	Availability	246.92	-	-	-	-	-	-	-	-	-	-

The calculated revenue using the 1 fist year of the three year phase in and the average price increase of 11.12% is shown in Table 71 below.

Table 71

SWARTLAND						
CALCULATED REVENUE		2022/2023 Proposed	2022/2023 Reference	Difference	Structure change	Initial cost reflectiveness
Nr	TARIFF NAME	R/year	0.00%	Rand	%	
1	Pre-paid meter system (Indigent Residential)	32 908 736	29 615 493	3 293 243	11.12%	-91.3%
1	Households Alternative <20 Amp:-	3 628 364	3 177 179	451 185	14.20%	-17.4%
1	Pre-paid Meter System (Non-Indigent Residential)	71 605 236	63 919 063	7 686 173	12.02%	3.1%
1	Residential Consumers (Houses, Flats & Farms) Network charge per	92 473 990	86 265 699	6 208 290	7.20%	17.3%
1	Residential Consumers (Houses, Flats & Farms) Network charge per	-	-	-	#DIV/0!	#DIV/0!
1	Net Metering Residential (for Approved SSEG Households)	865 122	920 475	-55 353	-6.01%	12.2%
1	Commercial Pre-paid:-	16 979 599	15 840 417	1 139 182	7.19%	14.2%
1	Commercial Alternative < 15 AMP:-	1 334 097	1 144 946	189 150	16.52%	-10.1%
1	Commercial Alternative < 15 AMP:-Dept	78 072	67 003	11 069	16.52%	14.1%
1	Commerce / Non Standard (per kWh)	5 209 633	3 994 336	1 215 296	30.43%	-1.4%
1	Commerce / Non Standard (per kWh)-Dept	163 279	120 353	42 926	35.67%	-3.2%
1	Commerce Basic < 20KVA (Basic per month)	3 552 156	3 555 275	-3 119	-0.09%	40.6%
1	Commerce Basic < 20KVA (Basic per month)-Dept	336 565	339 419	-2 854	-0.84%	49.6%
1	Commerce Basic 20 to 40 KVA (Basic per month)	8 174 866	7 709 107	465 759	6.04%	18.8%
1	Commerce Basic 20 to 40 KVA (Basic per month)-Dept	814 623	785 424	29 199	3.72%	36.3%
1	Commerce Basic >40 KVA (Basic per month)	20 970 750	19 769 146	1 201 604	6.08%	22.1%
1	Commerce Basic >40 KVA (Basic per month)-Dept	709 975	738 617	-28 642	-3.88%	51.2%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	-	-	-	#DIV/0!	#DIV/0!
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	-	-	-	#DIV/0!	0.00%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!	0.0%
1	Sports Grounds including maintenance of Floodlighting:-	415	561	-145	-25.92%	0.0%
1	Bulk Industrial	63 046 916	53 036 074	10 010 842	18.88%	-10.0%
1	Bulk Industrial-Dept	7 696 218	7 315 284	380 933	5.21%	20.8%
1	Bulk Industrial mv	90 156 518	77 899 064	12 257 454	15.74%	-2.0%
1	Net Metering Industrial (for Approved SSEG)	-	-	-	#DIV/0!	0.0%
1	Bulk Time Of Use Tariff: Alternative	12 312 239	11 001 518	1 310 721	11.91%	5.4%
1	Bulk Time Of Use Tariff: Alternative MV	42 228 246	37 389 029	4 839 217	12.94%	3.3%
1	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	2 570 300	-	2 570 300	#DIV/0!	0.0%
1	Net Metering Commercial;Basic Charge <= 20 kVA per month	2 570 300	-	2 570 300	#DIV/0!	0.0%
1	Net Metering CommercialBasic Charge 21 - 40 kVA per month	2 570 300	-	2 570 300	#DIV/0!	0.0%
1	Net Metering CommercialBasic Charge 41 - 50 kVA per month	-	-	-	#DIV/0!	0.0%
1	Streetlights - Internal Tariff	6 079 959	433 296	5 646 663	1303.19%	0.0%
1	Wheeling Charges:	-	-	-	#DIV/0!	0.0%
1	Availability	4 234 861	3 430 130	804 732	23.46%	-31.0%
1	**Total.**	**493 271 332**	**428 466 906**	**64 804 426**	15.12%	**0.0%**
1		438 406 144	**11.12%**	**54 865 188.24**		

24. TARIFF SCHEDULE

The proposed tariff schedule is shown in **Table 72** It shows the following rates:

- The actual 2023/2024 rates.
- The fully cost reflective rates for 2023/2024.
- The proposed rates for 2024/2025 with phase in and annual price increase.

Table 72

	Swartland Municipality					
	ELECTRICITY: TARIFF CHARGES TRADING SERVICES (Excluding VAT)	2022/2023	2023/2024	COS 2023/2024	Proposed 2024/2025	% Tariff Increase
					11.12%	
7	**Pre-paid meter system (Indigent Residential)**					
7	(0-50) kWh/month : R/kWh	R1.2398	R1.4690	R1.9267	R2.1410	45.75%
7	(51-350) kWh/month : R/kWh	R1.6261	R1.9267	R1.9267	R2.1410	11.12%
7	(351-600) kWh/month : R/kWh	R2.3183	R2.7469	R2.7469	R3.0524	11.12%
7	(>600) kWh/month : R/kWh	R2.7861	R3.3013	R3.3013	R3.6684	11.12%
12	**Pre-paid Meter System (Non-Indigent Residential)**					
12	Basic charge: R/connection/month			R67.09	R24.85	New
12	Capacity charge: R/Amp/phase/month			R6.76	R2.50	New
12	(0-350) kWh/month : R/kWh	R2.5371	R3.0062	R2.0174	R2.9743	-1.06%
12	(>350) kWh/month : R/kWh	R2.7626	R3.2734	R2.0174	R3.2711	-0.07%
1	**Residential Consumers (Houses, Flats & Farms) Non Indigent: > 20 Amp single phase**					
1	Basic charge: R/connection/month	R268.1100	R317.6835	R67.09	R260.19	-18.10%
1	Capacity charge: R/Amp/phase/month			R6.76	R2.50	New
1	(0-50) kWh/month : R/kWh	R1.3523	R1.6024	R2.0174	R1.9343	20.71%
1	(51-350) kWh/month : R/kWh	R1.7388	R2.0603	R2.0174	R2.2735	10.35%
1	(351-600) kWh/month : R/kWh	R2.4471	R2.8996	R2.0174	R2.8953	-0.15%
1	(>600) kWh/month : R/kWh	R2.8818	R3.4147	R2.0174	R3.2768	-4.04%
5	**Households Alternative <=20 Amp:-**					
5	(0-50) kWh/month : R/kWh	R1.2398	R1.4690	R1.9267	R2.1410	45.75%
5	(51-350) kWh/month : R/kWh	R1.6261	R1.9267	R1.9267	R2.1410	11.12%
5	(351-600) kWh/month : R/kWh	R2.3183	R2.7469	R2.7469	R3.0524	11.12%
5	(>600) kWh/month : R/kWh	R2.7861	R3.3013	R3.3013	R3.6684	11.12%
4	**Commercial Alternative < 15 AMP:-**					
4	Per kWh: 20 Amp single phase	R3.0107	R3.5674	R4.0875	R4.1567	16.52%
8	**Commercial Pre-paid: 20 Amp single phase**					
8	Single Phase Per kWh	R3.0107	R3.5674	R4.0875	R4.1567	16.52%
8	Three Phase Per kWh	R3.0107	R3.5674	R4.0875	R4.1567	16.52%
2	**Commercial: Non-Standard >20 Amp single phase**					
2	Basic charge: R/connection/month			R95.17	R35.25	New
2	Capacity charge: R/Amp/phase/month	R12.59	R14.91	R12.49	R15.68	5.11%
2	Energy charge: R/kWh	R2.2561	R2.6733	R2.1500	R2.7767	3.87%
2	**Commercial: >20 Amp single phase**					
2	Basic charge: R/POS/month < 20KVA	R681.94	R808.03	R95.17	R633.84	-21.56%
2	Basic charge: R/POS/month 20 to 40 KVA	R896.99	R1 062.84	R95.17	R633.84	-40.36%
2	Basic charge: R/POS/month >40 KVA	R1 637.09	R1 939.79	R95.17	R822.61	-57.59%
2	Capacity charge: R/Amp/phase/month			R12.49	R4.63	New
2	Energy charge: R/kWh	R2.2561	R2.6733	R2.1500	R2.7767	3.87%
9	**Sports Grounds including maintenance of Floodlighting:-**					
9	Per kWh	R4.4637	R5.2890	R5.2890	R3.9181	-25.92%
6	**Streetlights - Internal Tariff**					
6	Maintenance charge (municipality undertakes maintenance) R/light/month	R1.4272	R1.6910	R3.8378	R3.8378	126.95%
6	Energy charge (municipality supplies power from its network) R/kWh			R44.4279	R49.3683	New
10B	**Small consumer: <50 kVA / SSEG Time Of Use: LV**					
10B	Time Of Use Tariff for Bulk Consumers: Basic cost per month			R81.13	R90.15	New
10B	Capacity charge per Amp/phase			R9.63	R10.70	New
10B	Low Demand Season					
10B	Peak: R/kWh			R2.6237	R2.9155	New
10B	Standard: R/kWh			R1.8654	R2.0728	New
10B	Off peak: R/kWh			R1.2528	R1.3922	New
10B	High Demand season					
10B	Peak: R/kWh			R7.6496	R8.5002	New
10B	Standard: R/kWh			R2.4502	R2.7227	New
10B	Off peak: R/kWh			R1.4182	R1.5758	New
3	**Bulk Industrial: Previously Maximum Demand, now TOU at LV**					
3	Basic charge: R/connection/month	R1 853.4290	R2 196.1280	R479.79	R1 804.61	-17.83%
3	Access charge: R/kVA/month (highest / notified demand.			R64.62	R23.93	New
3	Maximum Demand: R/kVA/month (Peak & Standard)	R356.5725	R422.5028	R77.43	R341.67	-19.13%
3	Active Energy: R/kWh	R0.8811	R1.0440			TOU
3	Low Demand Season					
3	Peak: R/kWh	R0.8811	R1.0440	R2.5277	R1.7097	63.76%
3	Standard: R/kWh	R0.8811	R1.0440	R1.9349	R1.4901	42.73%
3	Off peak: R/kWh	R0.8811	R1.0440	R1.4560	R1.3127	25.74%
3	High Demand season					
3	Peak: R/kWh	R0.8811	R1.0440	R6.4568	R3.1650	203.17%
3	Standard: R/kWh	R0.8811	R1.0440	R2.3921	R1.6594	58.95%
3	Off peak: R/kWh	R0.8811	R1.0440	R1.5852	R1.3605	30.32%
3	Reactive Energy: R/kvarh (Excess to 85% PF in P& Standard)			R0.2644	R0.0979	New
10	**Bulk Time Of Use Tariff: Bulk LV**					
10	Time Of Use Tariff for Bulk Consumers: Fixed/Basic cost per month	R1 853.4290	R2 196.1280	R479.7919	R1 804.61	-17.83%
10	Capacity charge per kVA notified			R64.6182	R23.93	New
10	Maximum Demand per KVA per month	R239.1461	R283.3642	R77.4327	R238.60	-15.80%
10	Low Demand Season					
10	Peak: R/kWh	R1.5276	R1.8101	R2.5277	R2.2772	25.80%
10	Standard: R/kWh	R1.0513	R1.2457	R1.9349	R1.6395	31.61%
10	Off peak: R/kWh	R0.6668	R0.7901	R1.4560	R1.1246	42.34%
10	High Demand season					
10	Peak: R/kWh	R4.6834	R5.5494	R6.4568	R6.5026	17.18%
10	Standard: R/kWh	R1.4187	R1.6811	R2.3921	R2.1314	26.79%
10	Off peak: R/kWh	R0.7703	R0.9127	R1.5852	R1.2633	38.41%
10	Reactive Energy: R/kvarh (Excess to 85% PF in P& Standard)			R0.2644	R0.0979	New

	Swartland Municipality					
	ELECTRICITY: TARIFF CHARGES TRADING SERVICES (Excluding VAT)	2022/2023	2023/2024	COS 2023/2024	Proposed 2024/2025	% Tariff Increase
					11.12%	
10A	**Bulk Time Of Use Tariff: Bulk MV**					
10A	Time Of Use Tariff for Bulk Consumers: Fixed/Basic cost per month	R1 853.4290	R2 196.1280	R630.3514	R1 860.37	-15.29%
10A	Capacity charge per kVA notified			R50.3284	R18.64	New
10A	Maximum Demand per KVA per month	R239.1461	R283.3642	R61.7504	R232.79	-17.85%
10A	Low Demand Season					
10A	Peak: R/kWh	R1.5276	R1.8101	R2.4729	R2.2569	24.68%
10A	Standard: R/kWh	R1.0513	R1.2457	R1.8929	R1.6240	30.36%
10A	Off peak: R/kWh	R0.6668	R0.7901	R1.4244	R1.1129	40.86%
10A	High Demand season					
10A	Peak: R/kWh	R4.6834	R5.5494	R6.3169	R6.4507	16.24%
10A	Standard: R/kWh	R1.4187	R1.6811	R2.3402	R2.1121	25.64%
10A	Off peak: R/kWh	R0.7703	R0.9127	R1.5509	R1.2506	37.02%
10	Reactive Energy: R/kvarh (Excess to 85% PF in P& Standard)			R0.2644	R0.0979	New
17	**SSEG export (customer on standard TOU tariff)**					
17	Addisional Admin Charge per Month (to Off-Taker)			R100.00	R111.1200	New
17	Export credit (if not on TOU)		-R1.2500		-R1.4090	12.72%
17	Low Demand Season					
17	Peak: R/kWh		-R1.2500	-R1.3549	-R1.5272	22.18%
17	Standard: R/kWh		-R1.2500	-R0.9633	-R1.0858	-13.14%
17	Off peak: R/kWh		-R1.2500	-R0.6470	-R0.7293	-41.66%
17	High Demand season					
17	Peak: R/kWh		-R1.2500	-R3.9502	-R4.4526	256.21%
17	Standard: R/kWh		-R1.2500	-R1.2653	-R1.4262	14.10%
17	Off peak: R/kWh		-R1.2500	-R0.7323	-R0.8255	-33.96%
11	Net Metering: Households Non-Indigent					
11	Net Metering: Households Non-Indigent Basic per month	R268.1100	R317.6835	Std tariff	Std tariff	
11	Import Energy kWh (supplied by municipality) 1 < 600 kWh	R2.0475	R2.4260	Std tariff	Std tariff	
11	Import Energy kWh (supplied by municipality) 2 > 600 kWh	R2.8818	R3.4147	Std tariff	Std tariff	
11	Export Energy kWh (supplied to municipality-max/month <= import kWh)	R1.0846	R0.7715	Std tariff	Std tariff	
13	Net Metering Industrial (for Approved SSEG)	New Tariff				
13	Monthly Basic Charge 1		R30.0000	Std tariff	Std tariff	
13	Monthly Basic charge 2		R2 196.1280	Std tariff	Std tariff	
13	Maximum Demand Charge per kVA/month		R422.5028	Std tariff	Std tariff	
13	Import Energy kWh (Supplied by the Municipality)		R1.0440	Std tariff	Std tariff	
13	Export Energy kWh (Supplied to the Municipality: Max/month <= Import kWh)		R0.7715	Std tariff	Std tariff	
14	Net Metering Commercial (for Approved SSEG)	New Tariff				
14	Monthly Baisc Charge 1 (Applicable to all Categories)		R30.0000	Std tariff	Std tariff	
14	Net Metering Commercial;Basic Charge <= 20 kVA per month		R808.0307	Std tariff	Std tariff	
14	Net Metering CommercialBasic Charge 21 - 40 kVA per month		R1 062.8435	Std tariff	Std tariff	
14	Net Metering CommercialBasic Charge 41 - 50 kVA per month		R1 939.7879	Std tariff	Std tariff	
14	Net Metering CommercialImport Energy kWh (Supplied by the Municiality)		R2.6733	Std tariff	Std tariff	
14	Net Metering CommercialExport Energy kWh (Supplied to Municipality: Max/month <= Import kWh)		R0.7715	Std tariff	Std tariff	
15	Net Metering Time of Use Bulk Consumers (for Approved SSEG)	New Tariff				
15	Monthly Basic Charge 1		R30.0000	Std tariff	Std tariff	
15	Fixed Charge per month		R2 196.1280	Std tariff	Std tariff	
15	Maximum Demand per KVA per month		R283.3642	Std tariff	Std tariff	
15	Low Season (Sept - May) Peak period per kWh		R1.8101	Std tariff	Std tariff	
15	Low Season (Sept - May) Standard period per kWh		R1.2457	Std tariff	Std tariff	
15	Low Season (Sept - May) Off-peak period per kWh		R0.7901	Std tariff	Std tariff	
15	High Season (Jun - Aug) Peak period per kWh		R5.5494	Std tariff	Std tariff	
15	High Season (Jun - Aug) Standard Period per kWh		R1.6811	Std tariff	Std tariff	
15	High Season (Jun - Aug) Off-peak Period per kWh		R0.9127	Std tariff	Std tariff	
15	EXPORT Energy kWh (Supplied to Municipality: max/month <= Import kWh)		R0.7715	Std tariff	Std tariff	
16	Wheeling Charges: Generator with a Wheeling Agreement with an Off-Taker (both the Generator and Off-taker in the Municipal network and Generator feeding in at 11 kV on Time of Use Only)	New Tariff				
16	Addisional Admin Charge per Month (to Off-Taker)		R500.0000	R100.00	R111.12	-77.78%
16	Time Of Use Tariff for Bulk Consumers: Fixed/Basic cost per month			R479.79		
16	Network Charge per Month (to Generator) (only for import power)		R2 196.1280	R50.3284		Refer Tariff 10
16	Maximum Demand Charge: per kVA per month (to Generator) (Only for import Power)		R283.3642	R61.7504		Refer Tariff 10
16	Credit to Off-Taker (Must be on Tariff 10): Eskom Megaflex Rate - Losses (Losses at 6.50%)		Eskom Megaflex - Losses	Eskom Megaflex - Losses		New
18	**Availability charges. (serviced stands not connected)**					
18	Monthly Charge		R200.0000	R266.6344	R246.9214	23.46%

25. CONCLUSIONS

This detailed Ringfencing, Cost of supply and Pricing study presented many different challenges. All these have been addressed and the results obtained are considered 90% accurate. The current tariffs were found needing major changes. These will send a clear signal about the value of capacity which in time will assist the municipality in controlling it costs which are largely dictated by capacity.

The COS study must now be workshopped internally and be approved by Council and then be submitted to NERSA. Once the budget process starts the proposed tariffs need to be submitted for proper public participation. Only once NERSA approval and public participation process is completed can implementation begin.

26. ANNEXURE

26.1. Allocation of network costs to tariff categories.

Before proceeding to the calculation of unit costs the issues of how to allocate network costs to different tariff categories need to be explored. NRS058 explores various methods. It is the consultant's expert view that the method that best allocates costs to the category of customers who cause the high demand and thus high costs should be based on each category of customer's contribution to the system peak. Various approaches could be followed in this respect such as not just using one single peak demand but maybe the average of the highest week or average of the 12 highest demands etc. The problem is that this requires very accurate data. The work in previous sections have already illustrated the problems with the data obtained reflected mainly in the fact the peak in the Eskom profile data and that from the simulated profile differ such that one is in the morning and the next in the evening. This caused the requirement to analyse the impact using the different methods. The results for the allocation of network costs at the highest voltage level network are reflected in Table 73.

Table 73

DEMAND ALLOCATER METHODS COMPARED								
AVERAGE AND ACCESS METHOD								
	Customer group demand responsibility ratio							
N2	D	L	A	B	C	E		
		An LF	P kWh/y	Tot kWh/y	P Ex MD	∑ Ex MD	Ex MD%	ENERGY RATIO
1Purchases								
2MV at HV sub	0.0%	50.56%	0	155 365 648	(0.000)	37 250.596	-10.0%	0.0%
3MV	8.5%	50.56%	20 312 152	155 365 648	1 390.910	37 250.596	54.0%	13.1%
4Ind	15.4%	50.56%	32 224 772	155 365 648	3 708.956	37 250.596	90.7%	20.7%
5Mun	31.1%	50.56%	30 561 763	155 365 648	15 925.343	37 250.596	433.6%	19.7%
6Comm	10.7%	50.56%	16 007 890	155 365 648	4 129.317	37 250.596	221.4%	10.3%
7Dom	33.2%	50.56%	54 339 321	155 365 648	11 715.377	37 250.596	170.0%	35.0%
8SSEG	0.2%	50.56%	266 611	155 365 648	88.221	37 250.596	260.9%	0.2%
9Lights	0.9%	50.56%	1 653 140	155 365 648	292.473	37 250.596	139.5%	1.1%
TOTAL			155 365 648					

N2	Customer group excess demand							
	C - excess demand	Ave MD	Group energy	Hours in year	PF	Non-co-incidental MD	Group energy	Annual LF
	kVA	kVA	kWh/y	8760	%	kVA	kWh/y	%
1Purchases								
2MV at HV sub	(0.00)	0.00	0	8 760.0	90%	0.0	0	100.00%
3MV	1 390.91	2 576.38	20 312 152	8 760.0	90%	3 967.3	20 312 152	58.45%
4Ind	3 708.96	4 087.36	32 224 772	8 760.0	90%	7 796.3	32 224 772	47.18%
5Mun	15 925.34	3 672.41	30 561 763	8 760.0	95%	19 597.7	30 561 763	17.80%
6Comm	4 129.32	1 864.68	16 007 890	8 760.0	98%	5 994.0	16 007 890	30.49%
7Dom	11 715.38	6 892.35	54 339 321	8 760.0	90%	18 607.7	54 339 321	33.34%
8SSEG	88.22	33.82	266 611	8 760.0	90%	122.0	266 611	24.94%
9Lights	292.47	209.68	1 653 140	8 760.0	90%	502.2	1 653 140	37.58%
Total	37 250.60	19 336.68	178 463 112	70 080.0		56 587.3	155 365 648	

NON CO-INCIDENTAL MD DEMAND ALLOCATER METHODS COMPARED							
N2		NON CO-INCIDENTAL MD	AVERAGE AND ACCESS METHOD	ENERGY RATIO	CO-INCIDENTAL PEAK DEMAND METHOD	Monthly LF	Ave & Access Adustment factor
1Purchases							
2MV at HV sub		0.0%	0.0%	0.0%	0.0%	100.8%	47.9%
3MV		7.0%	8.5%	13.1%	0.0%	62.8%	64.7%
4Ind		13.8%	15.4%	20.7%	0.0%	57.6%	74.3%
5Mun		34.6%	31.1%	19.7%	0.0%	21.2%	158.0%
6Comm		10.6%	10.7%	10.3%	0.0%	38.4%	103.8%
7Dom		32.9%	33.2%	35.0%	0.0%	42.4%	95.0%
8SSEG		0.2%	0.2%	0.2%	6.5%	27.5%	118.8%
9Lights		0.9%	0.9%	1.1%	0.0%	40.4%	87.0%

This shows the following:

The following in this respect:

- All methods yield similar results.
- The energy ratio method seems out of line with the other methods, as is to be expected.
- The average and access method and Non-co-incidental methods are almost identical.
- From the profiles it is clear that the annual peak demands are mainly caused by residential customers.
- The co-incidental peak demand methods best reflect this reality which will show domestic costs even higher.

For simplicity's sake and similar results with the Average and access method the non-co-incidental peak demand method was used as basis to allocate all network costs.

26.2. Definitions.

Ampere (A): The unit in which electric current is measured being the rate of flow of electric current through a conductor and which is comparable to the rate of volume of water flow through a pipe.

Capacity utilisation. – This refers to the extent to which the capacity that has been installed for a customer has been utilised by the customer.

Charges. – This refers to different charges that a customer has to pay such as a charge for energy or charge for installed capacity.

Clients. – This refers to other contacts of the utility such as contractors, consultants, etc.

Connection fee: The minimum, once-off, up-front payment for new or additional capacity

Consumers. – This refers to any user of electricity whether it be an illegal connected supply, unpaid supply or third-party person.

Cross subsidy. – This refers to cases where one set of customers are subsidised by another set of customers because their tariff does not cover their cost of supply.

Customer. – This refers to a consumer that is legally connected to the electricity network, is contracted with the supply utility and is paying their dues.

Demand charge: A R/kVA or R/kW charge which is time and/or seasonally differentiated and is applied to the chargeable demand registered during the month.

Demand tariffs. – This refers to tariffs that charge for the maximum demand taken by the customer every month.

Diversity Factor: This is defined as the ratio of the sum of individual consumers' non-coincident maximum demands to the total maximum demand of a group, which is an indication of the extent to which the same capacity can be used for different consumers

Electrical Energy – This refers to the amounts of units of electricity consumed. This is normally measured for a month.

Gigawatt (GW): Equal to one thousand MW or one million kW.

Inter tariff cross subsidies. – This is where one category of customers is cross-subsidising another category of customers.

Intra tariff cross subsidies. – This is where there is cross subsidisation between the different customers within a particular customer category such as high usage customers cross-subsidising low usage customers.

kWh (kilo Watt hour) – This is the unit of measure for energy. It means 1000 of Watt hours. In other words, if a 100 Watt globe was burning for 10 hours.

Kilovolt-Ampere (kVA): The product of volts and amperes times 1 000, i.e. V x A x 1 000. This is a measure of "apparent" electrical power.

Kilowatt (kW): The product of kVA and power factor which is a measure of "true" electrical power. The expression for kW is V x A x power factor x 1 000.

Kilowatt-hour (kWh): The total amount of energy used in one hour by a device that requires one kilowatt of power for continuous operation, i.e. the product of kilowatts and hours.

kVA (kilo Volt Ampere) – This is the unit of measure for maximum demand. It includes the real and reactive components of power.

kW (kilo Watt) – This is also a unit of measure for maximum demand but only the real component. Here the calculation is done over a 1-hour period. The maximum demand taken by ten 100-Watt globes equals to 1 kW.

Load factor. – This refers to the amount of electricity consumed by a customer in a billing period relative to the amount of energy that could have been consumed had the appliances been kept on all the time. This indicates how effective the capacity had been used.

Load factor (LF) annual: Total kWh/y divided by the highest maximum demand in the year times 12 times the total hours in the year. (Total kWh for year) ÷ (Highest maximum demand in year x 12 x hours in year).

Load factor (LF) average monthly: Total kWh/y divided by the sum of the maximum demands of all months in the year times 12 times the total hours in the year. (Total kWh for year) ÷ (Sum of 12 maximum demands in year hours in year).

Life line. – This refers to a tariff that provides support, subsidy, discount to customers. This is usually not available to all customers and provide more support at low consumption levels and become more expensive at high consumption levels.

Maximum demand. – This refers to the maximum demand that the customer places on the network normally averaged over a half hour period.

Megawatt (MW): Equal to one million Watts or 1 000 kW.

Network voltage. – This refers to the voltage at which the network operates. This voltage is usually higher to transfer large amounts of power.

Network capacity. – This refers to the maximum rating of the network equipment that has been installed to supply a customer. This is expressed as kVA or A (Amperes).

Point of delivery (POD): A physical point on the electrical network, where electricity is delivered to a customer, usually the metering point.

Point of supply: It could be a single point of delivery to a customer or a specific group of points of delivery on the System from where electricity is supplied to the customer.

Power Factor (PF): The ratio kW / kVA indicates the ratio of “true” electrical power to “apparent” electrical power, i.e. the ratio of useful work to the total quantity of volts and amperes supplied.

Reactive energy charge: In case of Megaflex, it is levied on every kvarh which is registered in excess of 30% of the kWh supplied during the specified periods of the month.

Supply voltage. – This refers to the voltage at which customers are supplied. The supply voltage for households is usually 240 V (volt).

Single energy rate tariff. – This refers to a tariff that only has one charge and that is a simple energy charge eg. 25 c/kWh.

Seasonal tariffs. - This refers to tariffs where the price for electricity consumed during different seasons of the year is different. This is because there is a much higher demand for electricity typically in Winter making it more expensive to provide.

Tariff. – A tariff is the combination of various charges as mentioned above to make up a tariff applicable for a specific customer category.

Tariff structure. – This refers to the type of charges in the tariff as well as the relative sizes of the different charges.

Tariff restructuring. – This refers to the process of changing the charges in a tariff but also the relationship with other tariffs.

Two part tariff. - This refers to a tariff that has a single energy rate plus a fixed charge, sometimes called a basic charge. For example, the tariff has a basic charge of R100/month and an energy rate if 105 c/kWh.

TOU (Time of Use) tariffs. - This refers to tariffs where the electricity consumed at different times of the day is measured separately and are charged for differently.

Time-of-use (TOU) tariff: A tariff that has different energy rates for different time periods and seasons in order to reflect different cost of supply at different times more accurately.

Voltage discount. – This refers to a discount applied to customers supplied at higher voltages because it is cheaper to supply, and the customer incurs more costs to transfer the energy for their own applications.

Voltage (V): Measure of electric pressure that drives electric current through a conductor.

Watt (W): The unit of electrical power or energy transfer equivalent to one ampere flowing due to an electrical pressure of one volt at unity power factor, W = V x A

26.3. Abbreviations

<	less than	CRC	Current replacement cost.
≤	less than or equal to	ROA	Return on Assets
>	greater than	HV	High Voltage ≥ 40 kV
≥	greater than or equal to	MV	Medium Voltage ≥ 1000 V < 40 kV
A	Ampere	LV	Low Voltage < 1000 V
c	Cents	COS	Cost Of Supply
c/kvarh	cents / reactive kilovolt-ampere-hour	POD	Point of delivery
c/kWh	cents per kilowatt-hour	FBE.	Free Basic Electricity
CPI	consumer price index	EPP	South African Electricity Pricing Policy
GWh	gigawatt-hour	MFMA.	Municipal Finance Management Act
km	Kilometre	MSA	Municipal Systems Act
kVA	kilovolt-ampere	IBT	Inclining Block Rate Tariff
kvarh	reactive kilovolt-ampere-hour	POS	Point of Supply
kV	Kilovolt		
kW	Kilowatt		
kWh	kilowatt-hour		
MVA	megavolt-ampere		
N/A	Not applicable		
NERSA	National Electricity Regulator of South Africa		
NMD	Notified Maximum Demand		
PF	Power factor		
R	Rand		
R/kVA	Rand per kilovolt-ampere		
R/kW	Rand per kilowatt		
TOU	Time-of-Use		
V	Volt		
VAT	value added tax		
W	Watt		
