MUNICIPAL TARIFFS: WHERETO FROM HERE?

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Contents.

ABSTRACT

- Municipal electricity tariffs are in shambles: NERSA IBT tariffs have created chaos beyond comprehension.
- Electricity is being sold at prices below the Eskom purchase cost.
- More and more low usage customers are increasing the subsidy burden.
- High usage, overcharged customers are converting to alternative energy solutions.
- NERSA is stipulating large customer tariffs at Eskom plus 20%, thus depleting any option of making a surplus.
- Despite all of this, large profits are being hidden.
- This paper will describe these problems and propose an approach in line with the Government Electricity Pricing Policy, where a fair deal is given to all customers and yet the Municipality is ensured of a fair income and profit.

1 INTRODUCTION

As Electricity Pricing Consultant to municipalities, I am growing more and more concerned over many aspects of municipal electricity tariffs.

These concerns relate to problems caused by Municipalities themselves and by NERSA. It also relates to aspects of tariff development and the application of tariffs.

The idea of the paper is not to criticize anybody, but to highlight some of the problems being created and the impact of these problems on the wellbeing of the whole industry. This should create awareness with decision makers of the possible loopholes that must be avoided.

2 DOMESTIC COST OF SUPPLY

Before assessing various issues, I will do a short cost of supply study for typical domestic customers in a municipality.

The figures used, are average from a range of municipalities, which I have undertaken tariff studies for during the past 5 years.

It is also important to note that this is not a comprehensive COS study but very limited. The inaccuracy of the study lies mainly in one aspect, namely that the average network costs are used instead of differentiating the costs at the various generic points on the network. That means that the costs of domestic networks, which are much higher than that for large customer's supplies, at higher voltages or higher up in the supply network, are understated. This shows that the domestic supply costs are understated.

The first table below shows the total costs for a typical municipality. The purchase cost, administration and customer service costs, are deducted to obtain the network costs only. The last column shows the costs, excluding capital which is to be the minimum for poor customers.

COST OF SUPPLY	2014/15			
2012/13 FINANCES	Full cost	% OF COST	NERSA Benchmark	Poor Cost
PURCHASES	122 515 157	80.6%	70%	122 515 157
Salaries and Wages	12 000 000	7.9%	10%	12 000 000
Maintenance	3 000 000	2.0%	4%	3 000 000
Capital Charges	4 500 000	3.0%	6%	
Other	10 027 303	6.6%	10%	
Total cost	152 042 460	100.0%	100.0%	137 515 157
Revenue	182 902 479			
Net Income	30 860 019	16.9%		

The table below shows the calculation of the average network cost per kVA for the whole municipality. This figure should be much higher for domestic networks.

NETWORK COSTS (general)	Full cost		Poor Cost
System ADMD	30 000	kVA	30 000
Sold ADMD (LV equavelant)	27 273	kVA	27 273
Customer service costs	8 514 288	Rand/y	8 514 288
Costs excl purchases and service	21 013 015	Rand/y	6 485 712
Network cost average	64.21	R/kVA/m	19.82

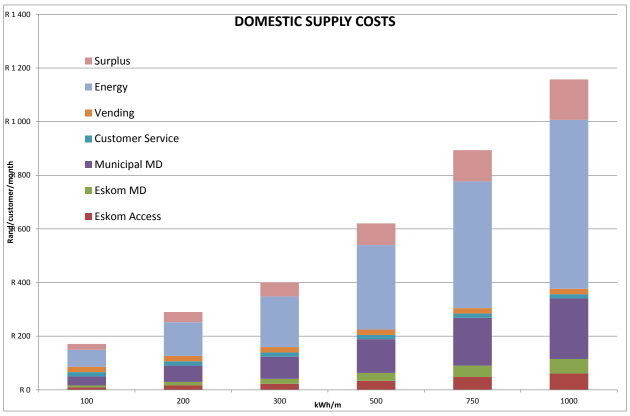
The next table shows the calculation of the unit and total cost for domestic customers at various consumption levels.

DESIGN OF SPU TARIFF	2014/15				
Domestic characteristics	Full cost				Poor cost
Annual LF	26%	35%	39%		26%
Average monthly LF	42%	51%	55%		42%
Aver usage	100	500.00	1 000.00	kWh/m	100
Annual MD	0.53	1.96	3.51	kVA	0.53
Average Monthly MD	0.33	1.34	2.49	kVA	0.33
Installed capacity	20.00	60.00	120.00	Amps	20.00
Domestic network cost	64.21	64.21	64.21	R/kVA/m	19.82
Eskom - Access	17.27	17.27	17.27	R/kVA/m	17.27
Eskom - Demand	21.85	21.85	21.85	R/kVA/m	21.85
Ratio: Installed Amp / Access MD	37.96	30.66	34.16	Ratio	37.96
Ratio: Installed Amp / Monthly MD	61.32	44.68	48.18	Ratio	61.32
Total Domestic Demand/Access	2.50	3.15	2.84	R/Amp	2.50
Eskom - Energy cost	63.00	63.00	63.00	c/kWh	63.00
Losses at LV	14%	14%	14%	% purch	14%
Surplus	15%	15%	15%	% of cost	
Basic cost	36.00	36.00	36.00	R/cust/m	36.00
COST REFLECTIVE CHARGES					
Basic charge	41.40	41.40	41.40	R/cust/m	36.00
Network Charge	2.44	2.44	2.44	R/A/m	2.50
Energy cost	81.27	81.27	81.27	c/kWh	71.82
COST REFLECTIVE REVENUE					
Basic charge	41.40	41.40	41.40	R/cust/m	36.00
Network cost	48.74	146.23	292.45	R/cust/m	50.05
Energy cost	81.27	81.27	81.27	c/kWh	71.82
Total energy cost	81.27	406.35	812.70	R/cust/m	71.82
Total cost	171.4	594.0	1 146.6	R/cust/m	157.9
Average cost	171.4	118.8	114.7	c/kWh	157.9

Whenever these figures are shown, it seems that this is a set of complicated calculations that are incorrect. For this reason, I have also included an alternative calculation method. The table below shows the various cost components. It is clear that it yields the same results as the other approach.

DOMESTIC COST SUMMARY						
kWh/m	100	200	300	500	750	1000
Eskom Access	9.10	16.32	22.18	33.80	47.95	60.66
Eskom MD	7.13	13.30	18.71	29.34	42.36	54.42
Municipal MD	33.83	60.66	82.46	125.65	178.29	225.52
Customer Service	16.00	16.00	16.00	16.00	16.00	16.00
Vending	20.00	20.00	20.00	20.00	20.00	20.00
Energy	63.00	126.00	189.00	315.00	472.50	630.00
Surplus	22.36	37.84	52.25	80.97	116.56	150.99
Total	171.41	290.12	400.59	620.76	893.66	1 157.60

The graph below shows the total cost at the various consumption levels.



The following very important observations can be made from this:

- The fixed costs associated at 100 kWh/m are close to R85/month.
- The average price reduces from 171 to 115 c/kWh at 100 vs. 1000 kWh/month.

Based on my experience, I would estimate that the average costs would not differ by more than plus or minus 20% for the different municipalities in South Africa. This gives a good basis to start analysing some of the current practices in Municipalities.

3 INCLINING BLOCK TARIFFS (IBT)

The issue of application of IBT has been controversial since it has been forced down by NERSA. The issues relating to process will not be covered here, accept to say that NERSA has never answered the questions raised by AMUE / Salga. Various workshops were set up by NERSA to discuss this, but these were either cancelled or only issues of practical implementation were allowed.

Besides the many concerns with the IBT, the key problems that the industry now faces in respect of IBT, are as follows:

- The fact that the IBT tariff does not cover the operating cost of electricity supply. This means increasing cross-subsidy requirement.
- The on-going low increases for the first blocks, below the Eskom / average price increases.
- The emergence of renewable energy and the eroding of the municipal revenue base from high users.
- The practical problems associated with IBT are on both conventional and pre-paid.

3.1 Negative Financial impact

NERSA recently sent out a questionnaire where the status of IBT implementation is requested. One of the leading questions is what successes have been achieved with IBT and what the revenue impact was. These impacts should now be known and hopefully NERSA will make these available to the industry.

The negative impact on some of the municipalities has transpired and they are extreme.

- Municipality A in Gauteng, lost R53 mill with the introduction of IBT tariffs. Four years later this municipality now owes Eskom close to R200 mill.
- Municipality B in the Free State lost R75 million due to implementation of IBT.
- Municipality C in Eastern Cape would lose R15.5 mill, close to 14% of total revenue and this will wipe out the total surplus income on electricity.
- A small municipality in the Western Cape will lose R8.6 mill or 16% of total revenue and wipe out any surplus income.

Despite the massive reduction in charges to poor customers, non-payment is growing at an even faster rate.

All it has caused, is a non-appreciation for a very scarce resource and on-going increased usage.

The losses incurred have either put municipalities in a very serious financial shortfall situation, or the brunt of the burden has been placed on large customers. It must be understood that this burden is showing its impact in many ways such as:

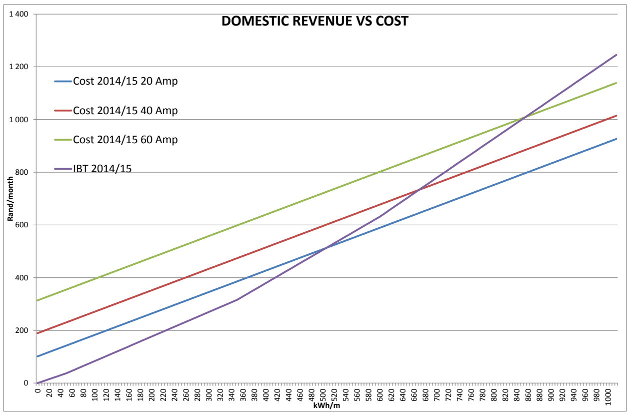
- Mines not being able to pay their workers properly.
- Factories and businesses closing down and jobs being lost.

3.2 Cost Vs revenue

The reasons for a lot of the revenue losses are because municipalities were applying tariffs that are closer to cost reflective than the IBT. I will illustrate this by comparing it with the COS study results. Remember that these are the most conservative figures possible. In the real situation the costs would be much more.

DOMESTIC TARIFFS												
		Basic	Capacity	Energy								
Tariff	Capacity	Per month	Per kVA (installed)	Block 1 rate	Block 1 kWh	Block 2 Rate	Block 2 kWh	Block 3 Rate	Block 3 kWh	Block 4 Rate		
	Amps	R/m	R/kVA/m	c/kWh	kWh/m	c/kWh	kWh/m	c/kWh	kWh/m	c/kWh		
Cost 2014/15	20	41.40	13.51	81.27	All							
Cost 2014/15	40	41.40	16.65	81.27	All							
Cost 2014/15	80	41.40	15.33	81.27	All							
IBT 2014/15	20			74.00	50.00	93.00	350.00	126.00	600.00	148.00		
REVENUE	**kWh/m**	kWh/m	100									
Amps		**0**	**100**	**200**	**300**	**400**	**500**	**600**	**700**	**800**	**900**	**1000**
20	Cost 2014/15	101	183	264	345	427	508	589	670	752	833	914
40	Cost 2014/15	189	271	352	433	514	596	677	758	840	921	1 002
80	Cost 2014/15	314	395	476	558	639	720	802	883	964	1 045	1 127
20	IBT 2014/15	0	84	177	270	379	505	631	779	927	1 075	1 223

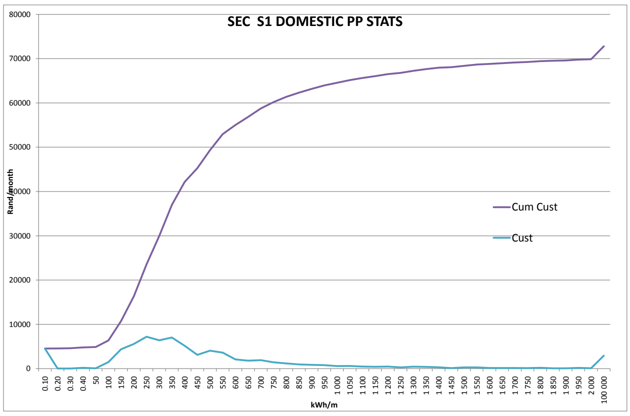
This is shown graphically in the graph below.



The following observations can be made from this comparison:

- At 100 kWh/m the shortfall is R101 per customer per month and at 350 kWh/m R70/month.
- Customers with 40 Amp circuit breakers typically use less than 600 kWh/m and no surplus is made from these customers.
- Customers with 80 Amp circuit breakers, will breakeven with cost close to 900 kWh/m.

To understand the impact of these tariffs, we need to know how many customers are using at the different consumption levels. The table below shows the situation for a typical municipality.



The following can be concluded from this in respect of the financial impact:

- 56 520 customers use 350 kWh/m or less and are subsidised by on average R80 per month which is equal to R4.5 mill.
- There are 3 982 customers that use more than 900 kWh/m. They would need to be overcharged by R1 135 per month each, to make up for the shortfall.

This would be close to a 100% overcharge. Surely this is not sustainable.

An even bigger concern relates to the fact that these shortfalls are going to increase over time, because of the following:

- The number of poor (low usage) customers are increasing.
- The tariff increase allowed by NERSA on the first IBT blocks are below the average cost increases.

This means that the cross-subsidy impact is continuing to increase exponentially and unsustainably.

4 COMPLIANCE WITH LGMSA

Local Government is Governed inter alia by the Local Government; Municipal Systems Act, 2000. This makes the following stipulations:

In the introduction:

> "ensure that municipalities put in place service tariffs and credit control policies that take their needs into account"
>
> "(2)A tariff policy must reflect at least the following principles, namely that:
> I poor households must have access to at least basic services through-
> (i) tariffs that cover only operating and maintenance costs;

(d) tariffs must reflect the costs reasonably associated with rendering the service, including capital, operating, maintenance, administration and replacement costs, and interest charges;

I tariffs must be set at levels that facilitate the financial sustainability of the service, taking into account subsidisation from sources other than the service-

(i) the extent of subsidisation of tariffs for poor households and other categories of users should be fully disclosed.

(h) the economical, efficient and effective use of resources, the recycling of waste, and other appropriate environmental objectives must be encouraged:"

The question that needs to be answered is whether the current tariffs being enforced by NERSA, applies with the legal requirements. This will be tested below:

- In respect of Points (i) and (d). The table in section 2 showed that the average cost (excluding capital) of a poor customer using 100 kWh/m with a 20 Amp CB is 157 c/kWh. This is more than double the NERSA IBT first block and 70% more than the second block.
- In respect of Point (i) With the IBT tariff it is very difficult to quantify the subsidies as there are no cost reflective tariffs in place to compare it with. None of the NERSA documents even request this.
- Because the energy price for the high IBT block at 148 c/kWh is more than double the energy cost at 63 c/kWh, inefficient energy usage is encouraged and customers are moving to alternatives when electricity should still be used.

5 RENEWABLE ENERGY

The emergence of affordable renewable energy sources are beginning to make big inrushes in South Africa. People are beginning to undertake many actions to reduce their electricity consumption.

This trend for more efficient use is welcomed and must be encouraged. The problem is that the municipal revenue base is being eroded by far more than the cost savings, which is causing a financial squeeze.

Each of these measures has an impact on the consumption level and on the Maximum Demand (MD) of the municipality. The impact of each is shown in the table below.

PROFILE IMPACT OF EFFICIENCY MEASURES			
	Measure	kWh	MD
1	LED / efficient lights.	100%	100%
2	Solar water geysers.	100%	70%
3	PV systems.	100%	10%
4	Gas for cooking.	100%	100%
5	Gas for space heating.	100%	80%
6	General awareness.	100%	80%

All of these will impact the kWh used to the full extent of the efficiency impact. The impact on system Maximum Demand (MD) is however very different for each:

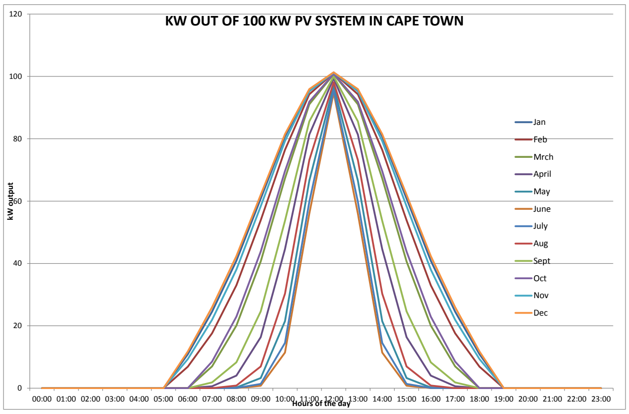
Efficient lights. The lights are used:

- To some extend during the early hours of the day, where it has a very small impact on system MD.
- Largely in the evening, where it will have a full impact on the system MD.

Solar Water geysers. These will have a significant impact on reducing the MD on the system during the morning and evening system MD.

- Provided the system is set up for the element not to be on during these times. The general advise should be to boost the system with electricity:
    - From 04h00-06h00, before system demand starts climbing and then there will be hot water for morning activities.
    - From 16h00 to 18h00, before the system starts going into its highest peak. These times should be adjusted between summer and winter.
- If the systems are not set up like this, it could impact the system MD negatively.
    - If the element comes on from 18h00 to 20h00, which by the way is the ideal from a total kWh usage perspective, because then the sun is fully set.
    - This could even cause the MD to be higher than when a normal geyser is used during a cloudy day.

PV systems: The PV systems mostly installed are without battery storage and thus will only impact electricity profile while generating. PV systems will reduce the demand, based on the typical profile of a PV system, which is illustrated in the graph below.



It is important to note that this applies to most of the country, but in the Western Cape, the output will be on average up to 1 hour earlier. This means that with the evening peaks (18h00-20h00), the impact will be minimum, except for the 3 summer months in the Western Cape, where less than 20% of demand will be impacted. We can thus conclude that PV systems will in itself have a minimal impact on system evening peak demand. If customers move some of their loads to the daytime to maximise the usage of the PV system, the system peak demand would be reduced.

The real problem comes on the very cloudy days. During these days, when it is mostly also cold, the PV system output will be reduced significantly, thus requiring the customers to make full use of grid electricity. The customers can thus also not reduce their own circuit breaker sizes significantly, if they want to avoid being without electricity during these critical days.

The conclusion is that PV systems will not reduce the system peak MD significantly and also not the customer's required circuit breaker capacity. This is more a reality in the Western Cape, when due to the rainy season, have a lot of cloudy days.

Gas for cooking. Using gas for cooking is very good for the electricity system, because it reduces the system MD more than it impacts the kWh used. This happens because it is largely used during the system peak times (18h00 to 20h00).

Gas for space heating. When customers use alternatives for space heating, that includes gas, it is very good for the system. The typical annual load factor for space heating is less than 4% (3 months for 4 hours per day). At least 2 of these hours are during the system peak times. This should thus be welcomed by utilities, provided the tariffs are set correctly.

General awareness. General awareness should impact the kWh and system impact to a similar extent, except when the customers experience an extreme cold spell or having a big function at home. This may result in people to ignore all savings and fall back into old habits and thus not reducing the system MD.

The impact of reducing kWh and reducing MD is shown in the table below.

LOAD REDUCTION IMPACT							
kWh/m	**Lights**	**Solar**	**PV**	**Cooking**	**Heating**	**Awareness**	
kWh reduction	150	300	500	150	155	50	1305
MD reduction kW	0.20	0.20	-	1.20	2.00	0.17	
Eskom Access	3.45	3.45	-	20.72	34.54	2.96	
Eskom MD	4.37	4.37	-	26.22	43.70	3.75	
Municipal MD	12.84	12.84	-	77.05	128.41	11.01	
Customer Service	-	-	-	-	-	-	
Vending	-	-	-	-	-	-	
Energy	121.91	243.81	406.35	121.91	125.97	40.64	
Surplus	21.39	39.67	60.95	36.88	49.89	8.75	
Total	**163.96**	**304.15**	**467.30**	**282.78**	**382.51**	**67.10**	
Revenue IBT	222.00	444.00	740.00	222.00	229.40	74.00	
Revenue COS	124.10	246.00	406.35	135.07	147.90	42.52	
Net impact							
IBT tariff	(58.04)	(139.85)	(272.70)	60.78	153.11	(6.90)	(263.60)
COS tariff	39.86	58.14	60.95	147.72	234.61	24.59	565.87

The following should also be considered in this respect:

- In this table, the effect that the energy cost is more expensive during peaks and especially during high demand period, has not even been considered. This will make the impact of Lights, Cooking and especially Space Heating, much better.
- It has been assumed that if customers introduce these measures and at the same time downgrade their circuit breaker sizes. If they do not, the COS tariff option will look even better.

The following can be concluded from this:

- The big reason why the introduction of renewable energy will be negative is because of the application of the IBT tariffs and thus the very high prices for marginal sales (the highest of units per month).
- The negative impact can totally be overcome, and in fact be turned into a positive impact, if COS tariffs are applied.
- In cases where power is injected into the system from PV systems, a further benefit can be enjoyed by the municipality provided:
  - The COS tariffs are applied.
  - Energy is purchased from the customer in TOU basis equal to the Eskom energy charges, plus levies.
- When customers' consumption reduces, they will eventually move to the scenario where they will not contribute to the cross subsidies, but will not even cover their own costs. NERSA's whole cross subsidy plan will thus not succeed.

6 LARGE CUSTOMER (COS)

A simplified cost of supply (COS) study is done here as a basis for the analysis of large customer tariffs. The table below show a simplified COS study for large customers.

NETWORK COSTS (general)	Full cost			
System ADMD	30 000	kVA		
Sold ADMD (LV equavelant)	27 273	kVA		
Customer service costs	8 514 288	Rand/y		
Costs excl purchases and service	21 013 015	Rand/y		
Network cost average	64.21	R/kVA/m		
LARGE CUSTOMER ANALYSIS			**Access**	**Demand**
Average MD network cost	64.21	R/kVA/m	R 25.68	R 32.10
Eskom MD charge	21.85	R/kVA/m		R 21.85
Eskom Access charges	17.27	R/kVA/m	R 17.27	
Total large customer demand costs	103.32	R/kVA/m	R 42.95	R 53.95
LPU co-insidence factor of MD	65%			
Total LPU MD COST	72.53	R/kVA/m	R 30.15	R 37.87

The table below continues this analysis by adding the surplus and losses and comparing the cost with current charges. A fact that has a major impact on the results of these analysis, relate to how the Eskom MD and Access Charges are applied as either:

- An access charge or MD charge to customers.
- As part of the energy cost as a c/kWh charge.

The method used here, is to use it as applied to the municipality and thus expose customers to the same signals. This is the recommended method.

LARGE CUSTOMER ANALYSIS	(2014/15	
at MV	**Demand**	**Energy**
	R/kVA/m	**c/kWh**
Current charge	181.38	59.49
	Access / MD	Energy
Cost	72.53	56.74
Losses	8%	8%
Surplus	17%	17%
Cost	90.57	70.85
Differences	Overcharge	Undercharge
	100.3%	-16.0%
Large customer caracteristics.	Ave LF	45.0%
Ave price at cost	c/kWh	98.42
Ave price at tariff	c/kWh	114.70
Overcharge	c/kWh	16.28
	%	17%

The following can be said in this respect:

- The energy charge is less than cost.
- The demand charge is by far overstated.
- The total revenue exceeds the cost, plus a surplus of 16% by a further 17%.

It is thus clear that large customers cross subsidise domestic customers, especially at low usage.

7 LARGE CUSTOMER (TOU)

The next issue that needs debate is the time of use (TOU) tariffs for large customers. The EPP stipulates the following on this issue in December 2008 (6 years ago):

Policy Position: 31

Tariffs must include TOU energy rates as follows:

- *all customers supplied at MV or above within two years;*
- *all customers above 100 kVA within five years;*
- *all cases where the metering provides such features within five years; and*
- *all other customers where it is warranted.*

Many municipalities have progressed far in this respect and more and more TOU meters are being installed for large customers. These meters are expensive and many municipalities have taken the route of providing communications to the meters, which makes sense, but is even more costly.

I want to address the problem of tariff structure and levels. Based on years of experience, the following is proposed for the design of the TOU tariffs, which is very similar to the Eskom Megaflex (MF) tariff:

Basic charge. This is applicable per point of supply and should be as close as possible to the customer's services costs including the cost of metering. It should be differentiated by:

- Customers supplied at low Voltage (LV).
- Customers supplied at Medium Voltage (MV) 6.6 kV to 22 kV. This charge should be higher, because more attention is given to these customers and a more expensive metering installation, which includes a VC/CT unit and in some cases a dedicated ring main unit or T-switch.

TOU periods: The seasons and time of day periods should be similar to that of Eskom even if the local peaks are different from the Eskom peak periods.

Access charge: An access charge should be applied to cover:

- the dedicated part of the network cost,
- the Eskom Access Charges.

It should be based on the highest of:

- the notified demand or
- the previous 12 months highest demand.

Maximum demand (MD) charges:
A maximum demand charge should be retained, but only applicable in the peak and standard times. It is to cover the:

- Rest of the network cost,
- Eskom MD charges.

And be as close to cost as possible.

Active Energy charges: The energy rates should be set equal to:

- the Eskom TOU energy rates (the basic rates plus the c/kWh all the other Eskom c/kWh levies)
- plus a **fixed c/kWh mark-up**. This ensures that when customers shift load to cheaper energy periods, the municipality does not lose any money by incurring a savings in Eskom purchase cost equal to the reduction in revenue.
- The c/kWh should be set by undertaking an impact study for as many as possible of the large customers involved and ensuring that the revenue on the new MD tariffs equal that on the new TOU tariffs.

Reactive energy charges should be applied similar to Eskom, to also provide a signal for customers to control their power factor during all peak and standard periods, even if it is not during their own system peaks. In absence of a study in this respect, a charge similar to Eskom is proposed.

Differentiation between MV and LV customers to be set equal to that found in a COS supply study. In absence of this, the same percentages for the maximum demand tariffs be applied, but this should be close to 5% higher on energy and at least 10% higher on demand for LV customers. This should be applied to:

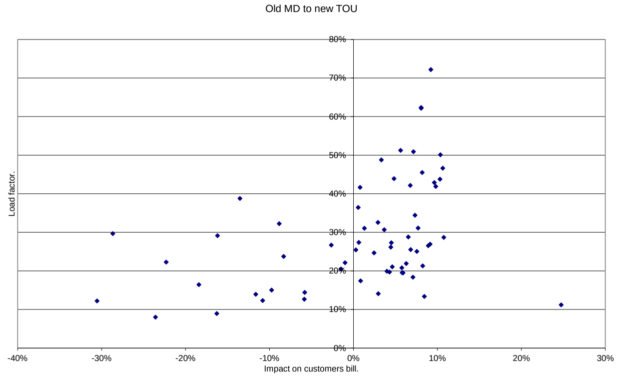
- The Access charges.
- MD charges
- Active Energy rates.

Public holidays should be treated as follows:

- The same as Eskom in cases where the meters are equipped with remote communications and can be programmed remotely.

- As normal week or weekend days with no alteration. The tariff rates must be set to ensure fair compensation. This is to avoid the onsite reprogramming of the meters annually.

An example of such an impact study is shown in the figure below. It shows the annual impact of all the MV customers in a municipality.



Although it looks like many customers will be less, the average impact was equal to the average increase of 7.39% required by the municipality. The reasons for higher and lower payments are as follows:

- Higher load factors (LF): generally increase more than average.
- Very high MD for only few months: generally have higher than average increase.
- Extensive usage during peak times: generally have higher than average increase.
- All customers: Big increase for June, July, August and a very small change in other months.

The only way recommended for implementation, is to do all large customers on an involuntary basis:

- First the MV customers.
- Then other large customers which can be phased on: those with MD > 200 kVA, then > 100 kVA and then the rest.

The reason for this is to ensure that the municipality's revenue base is not eroded, due to only those customers paying less when converting.

This will ensure that the current level of cross subsidisation by large customers is retained, but at least not increased and allowing them to reduce their bills through load shifting.

8 NERSA TOU TARIFFS

The biggest problem starts when the required analysis has been done and you apply to NERSA for approval. NERSA has a standard that says TOU tariff must be equal to Eskom plus 20%. NERSA was challenged on this basis, but no reply was ever received.

The table below shows the effective mark-up on the Eskom tariff when applying the NERSA guidelines.

AVERAGE PRICE INCREASE	
	NERSA guideline
COST LINE ITEM	**Munic % Cost**
PURCHASES	70.0%
Salaries and Wages	10.0%
Maintenance	6.0%
Capital Charges	4.0%
Other	10.0%
Surplus	20.0%
Total Revenue	120.0%
Revenue markup on Purchases	71.4%
Average price / purchase	1.71

This shows that if the NERSA benchmarks are used as a basis, an average mark-up of 71% should be allowed on the purchase price. Furthermore it shows that the ratio of selling price to purchase price should be 1.71 compared with its own benchmark of 1.6.

In assessing this figure the following should be recognised:

- If tariffs were cost reflective, the mark-up for large customers should be lower than for small customers due to the lower cost.
- With the massive cross subsidies to domestic customers, largely because of NERSA's IBT tariffs, large customers have to pay more than cost, thus requiring a higher mark-up.

This first section shows that a mark-up of 20% do not align with NERSA's other benchmarks. There is great sympathy and agreement with NERSA's strategy to reduce the overcharging of large customers. It can however not be done in the way they propose because:

- It is only enforced for new TOU tariffs. This means that existing serious discrimination of 85% mark-up is unaffected in any of the NERSA strategies.
- This means that municipalities simply cannot apply the new TOU tariffs at the NERSA levels, because they will lose too much revenue which means TOU is not progressing.
- If it is NERSA's strategy to reduce the overcharge of large customers a proper strategy much be developed which must:
    - set target reduction of tariff levels for the large customers paying the subsidies
    - and target increase of tariffs for the domestic customers receiving the subsidies
    - with a phase in plan.

Another problem with the way in which NERSA is applying the benchmark, is that it is proposing the same % mark-up be applied on all the Eskom rates. This is a major problem and will cause massive distortions from cost reflective, because of the following:

- If the same % mark-up is applied to the Eskom rates, a major distortion will take place and the tariff will not be cost reflective. This is because the mark-up on the Eskom network costs, should be a much higher % to cover all the municipal network cost, typically more than 100% mark-up.
- If a fixed % mark-up is applied to the energy rates, the c/kWh mark-up on the most expensive rates would be as much as 4 times more than on the cheaper rates. This means that when customers shift load from the expensive, to the cheaper time, as it is one of the objectives, the municipality will lose much more revenue than the savings in Eskom bill and thus net revenue. This is illustrated in the figure below.
- The mark-up should be based on cost and energy mark-up should ideally be in c/kWh except in case of losses.

TOU CHARGES	High			Low		
	High: Peak	High: Stanard	High: Off-Peak	Low: Peak	Low: Stanard	Low: Off-Peak
ESKOM MF MV	211.54	67.87	39.33	72.66	51.70	34.78
Proposed TOU	227.53	83.86	55.32	88.65	67.69	50.77
% markup	8%	24%	41%	22%	31%	46%
c/kWh mark-up	15.99	15.99	15.99	15.99	15.99	15.99
Fixed % mark-up	48.33	15.51	8.99	16.60	11.81	7.95
LOAD SHIFT IMPACT	Peak to Off-peak	Peak - standard	Standard - Off-peak	Peak to Off-peak	Peak - standard	Standard - Off-peak
c/kWh mark-up	-	-	-	-	-	-
% mark-up	39.34	32.82	6.52	8.65	4.79	3.87
% Loss	19%	48%	17%	12%	9%	11%

NERSA should thus rather develop a proper basis to determine benchmarks for municipal TOU tariffs.

9 CONCLUSIONS

It is clear that the industry is facing serious challenges from a tariff point of view:

- IBT tariffs that are applied are causing on-going escalating cross-subsidies, causing lost revenue and both of these are not sustainable and are impractical.
- If TOU tariffs for large customers are set according to the NERSA benchmark, municipalities will lose revenue when customers convert to TOU and when customers shift load to the cheaper periods.

The challenge that NERSA face when municipalities do not provide adequate information and submit their tariff applications late is recognised. This will contribute to NERSA having to make hasty decisions, without allowing adequate time to analyse the municipal proposals and get into meaningful debate with the municipalities.

On the other hand however, there have been many incidents where such opportunities did exist and NERSA has been unmoveable, despite sound arguments being made.

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In view of these problems the following processes is proposed for municipalities:

- Municipalities must develop tariffs that comply with the EPP.
- These tariffs must also comply with the MFMA.
- Tariff applications need to be made to NERSA in time.
- Municipalities must not accept approvals which do not "**that take their needs into account"** and appeal the NERSA decision.
- NERSA must develop benchmarks that have been properly analysed and consulted on.
- NERSA must negotiate with municipalities as they know their local circumstances best.

Municipalities are thus encouraged to do the following in terms of tariffs:

- Apply cost reflective charges for all their small customers with a
    - Basic charge,
    - Amp charge and
    - Energy charges (possibly seasonally differentiated).
- Make available a life line tariff with:
    - a single energy rate
    - restricted to 20 Amps maximum and
    - that equals the operating cost.
- Large customer TOU tariffs must be based on cost and must initially ensure revenue neutrality, with existing tariffs, with energy rates, with a fixed c/kWh surcharge.
- If large customer cross subsidies are to be reduced, it needs to be targeted as a specific strategy and it must be clear to everyone and not hidden behind a TOU tariff.

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