

8.7 Seasonality

There is a marked difference in the amount of usage during the high demand (winter) season versus the low demand (summer) season nationally and, therefore, the costs also differ accordingly. For this reason all tariffs should be differentiated by season to accurately reflect the full cost difference as is reflected in the wholesale energy charges and not by the local / customer specific seasonality.

Policy Position: 30

a) *All licensees shall differentiate their energy charges by season in line with wholesale energy prices with a view to addressing the seasonal cost differences.*

8.8 Tariff Structure and Level

In some utilities in the world the application of tariffs, both in structure and levels, are based on LRMC. In South Africa the tariff levels do not recover the revenue requirement associated with LRMC. Against this background the tariff levels and structures should be as set out below.

Policy Position: 31

a) *Tariff structure and levels shall be aligned with the results from the COS studies in which the resultant income will equal the revenue requirement.*

8.9 Cost-Reflective Versus Pricing Signal

Customers respond to the signal provided by the electricity prices. The question arises: should the tariff be modified from the COS with the objective of creating a specific signal to customers to achieve a specific objective?

Policy Position: 32

a) *Cost reflective tariffs are considered the most effective pricing signal to be provided to customers. Any additional pricing signals over and above the costs must be motivated specifically and be approved by NERSA.*

8.10 Time of Use Tariffs

The load profiles of customers differ significantly. The application of tariffs with only one energy rate result in large cross-subsidies and, therefore, customers do not have the opportunity to respond by using less power at more expensive times. Eskom introduced TOU tariffs more than 15 years ago. Since then the majority of Eskom's large customer sales are at TOU. This is not the case with municipalities where only a very small percentage of sales in the municipalities are at TOU. For this reason the application of TOU tariffs to all customers in the industry should be promoted actively.

Policy Position: 33

a) *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.*

8.11 Time of Use Tariff Structures

The structure of TOU tariffs is very important to signal long term pricing signals, but provision should also be made to cater for emergency signals where possible.

Policy Position: 34

a) *TOU tariff energy charges must be differentiated by:*

- *All the components as reflected by the WEPS.*
- *In addition a super peak rate to reflect the short terms costs could be applied during emergencies in which case customers need to be informed in advance.*

8.12 Distribution Geographic Price Differentials

All municipalities now apply one set of tariffs within the relevant area of jurisdiction of the municipality.

Policy Position: 35

a) *Tariffs charged to customers on the network will be cost-reflective within the relevant electricity utility. No geographic differentiation based on location will be applied within the area of a licensee except for farms (low density agriculture) and supplies associated with lower density.*

Eskom does not apply any distribution geographic differentiation in its national tariffs. This means that there is major cross-subsidisation between customers in the various parts of South Africa. This also creates a significant obstacle for restructuring the EDI.

Policy Position: 36

a) *Eskom shall apply pooling of costs and base its tariffs on the proposed RED boundaries.*

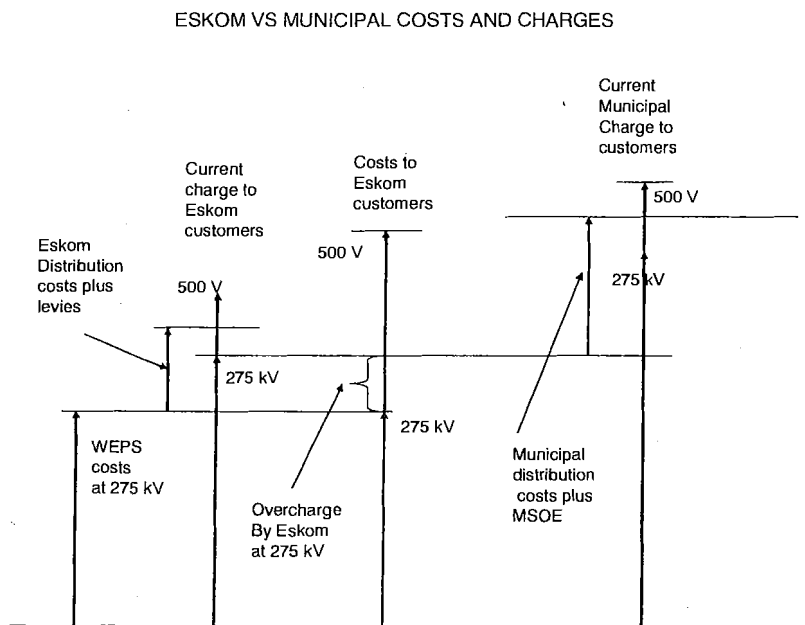
8.13 Voltage and Position Differentiation

Most utilities currently apply tariff differentials based on the supply voltage. The problem associated with the current practice is as follows:

- a. The level of the differentials is in general smaller than the actual cost differences.
- b. The differential is applied as either a percentage discount to the low voltage (LV) or a percentage surcharge on the high voltage (HV) tariff and the same percentage is applicable to the demand and energy rates.
- c. The differentials are applied to the supply voltage only without reflecting the system voltage. Costs differ significantly for supplies directly from the LV side of a substation and that of a customer taking a supply from deep in the LV network, although both are supplied from the same voltage.

Eskom's current voltage differentials are not cost reflective, resulting in an overcharge of the large municipalities and other customers at higher voltages which in turn leads to an overcharge of the municipality's customers. This means that a similar customer supplied by Eskom versus one supplied within the municipality's area could pay a very different price which is not cost based. In terms of a directive from the Competition Commission, this practice could possibly be a contravention of the law. This dilemma is illustrated in the figure below.

Figure 6: Eskom Voltage Differentials Problem

**Policy Position: 37**

a) Voltage and supply position differentials must be applied in tariffs within a licensed distributor as follows:

- based on the supply and system voltage;
- based on the cost differences from the cost of supply study;
- to be applied as different energy & demand / capacity charges not as a percentage on all charge; and
- NERSA must drive a plan for phased increases in tariffs at lower voltages and decrease of tariffs at higher voltages.

8.14 Domestic (Residential) Tariffs

Domestic customers present significant challenges for utilities because of their large numbers and the many different types of domestic customers with diverse needs. Utilities should start charging cost-reflective tariffs for domestic customers, but also cater for cross-subsidisation of some customers. The detailed provisions for low income customers are discussed in the cross-subsidy section.

Policy Position: 38

a) Domestic tariffs to become more cost-reflective, offering a suite of supply options with progressive capacity-differentiated tariffs and connection fees:

- At the one end a single energy rate tariff with no basic charge, limited to 20 Amps and nominal connection charge (details under section on cross-subsidies);

- *At the next level a tariff with a basic charge, customer service charge, capacity charge and energy charge with cost-reflective connection charges; and*
- *At the final level TOU tariffs must be instituted on the same basis as above, but with TOU energy rates.*

8.15 Rationalising Electricity Tariffs

NERSA, together with the industry, should develop a national set of tariff structures for the industry. All utilities need to then adapt their tariffs in terms of the approved national structure. The tariff levels would remain different for each utility to match the local circumstances.

Policy Position: 39

- a) *NERSA shall rationalise existing electricity distribution tariffs into a set of electricity tariff structures for the EDI. The number of these sets will be governed by rationalising the number of distribution licensees through the restructuring process.*

8.16 TOU Tariffs and Low Income Customers

It has been suggested that low income domestic customers should not be exposed to TOU tariffs. This would be unwise. Although the cost of Automatic Meter Reading (AMR) systems for domestic customers is still expensive, prices are decreasing and when considering the load management and loss management features of these systems, their life cycle costs are already less than many of the current metering and load control options being applied in the industry. For this reason it is foreseen that AMR systems could be applied in low income areas and in such cases, TOU tariff could be made available. For the low income customers such tariffs could well have the same features as the life line tariff with some capacity limitation, no fixed charges and a low connection fee.

Policy Position: 40

- a) *With the availability of AMR systems for domestic customers, the option of a TOU life line tariff with no fixed charges must be researched by NERSA to offer more cost saving opportunities for low income customers.*

8.17 Treatment of Network Capital Contributions

There are various situations in the industry where the cost of new networks and even the expansion of existing networks are not funded by the utility, but by other sources such as:

- a. Through the connection cost. This is typically the service connection or in many cases the incremental costs.
- b. The State electrification fund grant towards the cost of establishing networks to supply new customers and maintain low connection fees.
- c. By way of capital contributions. Typically this is the contribution to cover the full cost of any existing or future infrastructure that would be used.
- d. In many cases developers would establish and fund infrastructure and then hand them over to the utility at no compensation.
- e. A utility often receives assets from another entity without any debt or equity associated therewith.

The issue at stake is whether a utility should be allowed to apply depreciation and earn a return on these assets which are funded by the customers outside of the tariff. If this is allowed, it would mean that customers would have to pay twice for the same network assets. The principle thus is when the upgrade or refurbishment of these assets are due, the required funds could either be obtained from existing profits or debt for which customers would then eventually need to pay.

Policy Position: 41

- a) *Any assets which are not financed by the distributor, but from sources such as: State grants, customer capital contributions and connection fees, developer networks handed to the utilities and networks transferred to new utilities debt free, shall be excluded from the asset base for the purpose of determining depreciation and return on assets and in the same way these costs be excluded from COS studies.*
- b) *The provision for the replacement of these assets when it becomes due shall form part of the Licensee's revenue requirements as set out in 2.2*
- c) *These assets would, however, be included for provisions relating to all operating expenses.*

A wide range of practices used to be applied to recover a contribution from new customers / developers towards the cost of infrastructure being used for the new supplies. An industry standard (NRS 069 – Industry Standard for Recovery of Capital Costs for Distribution Network Assets) based on replacement cost was established and is currently applied by a number of utilities. However, it is not applied very widely and the calculation of the relevant rates is not regulated.

Policy Position: 42

- a) *A consistent methodology must be applied in the industry to govern the determination of capital contributions by customers / developers to ensure a fair and non-discriminating practice for all participants.*

8.18 Public Lighting

Many municipalities consider public lighting to be part of the electricity supply service and as such, expenses have to be covered by electricity customers. Public lighting is, however, a municipal service which is a consumer of electricity and not part of electricity supply. This is a service to the community, not to the electricity customer. The type of lighting and replacement of lights are subjects affected by the voters of the municipality and subject to issues of aesthetics, road safety and public safety. These matters do not form part of electricity supply and are very different to the criteria for determining expenditure on electricity networks. Worldwide systems of public lighting are considered part of municipal services and are thus paid by these authorities. The only exceptions are some developing countries where proper functioning municipal services have not been established. It is important to understand that it is not proposed that municipalities should now charge the tax payers more, but rather that the cost of public lighting should be shown separately and be charged separately to the municipality. The municipality may in turn recover this money from the Municipal Surcharge on Electricity (MSOE) or any other source.

Policy Position: 43

a) Public lighting, including street lights, high mast lights, parking area lights and traffic lights are considered as consumers of electricity and are not part of electricity supply. The associated charges must cover capital and operating costs associated with: energy, electricity network, dedicated lighting networks and lighting services. Such services may be provided by electricity utilities, but such costs must be charged to the appropriate owner, in most cases the municipality. The municipality can in turn fund such service from the MSOE.

8.19 Quality of Supply: n-1

Most utilities in the country traditionally applied the practice to provide supplies > 10 MVA or supplied at any voltage higher than LV, based on the formula of "n-1".

- a. During the past few years Eskom started to slip back to provide "n" only and whenever customers asked for "n-1," Eskom insisted that it be treated as a premium supply and the customer should pay the capital costs and operating costs associated with the additional equipment to provide "n-1".
- b. Municipalities also reverted to "n" in many cases, because the income they derived should have been used to fund the "-1" component which was abrogated.

In view of the socio / economic implications of having very long outages for such large supplies, it is recommended that all supplies > 10 MVA or supplied at any voltage higher than LV, be based on the principle of "n-1".

Policy Position: 44

a) The network standard shall be set to ensure that the cost of redundancy of distribution networks matches the socio / economic implications of power outages and willingness to pay to avoid such disruptions. Charges for all customers shall thus be based on the standard applied at each level in the network.

8.20 Customer Service Quality

NERSA currently regulates the quality of service to customers. It should be noted that the general customer service provided to customers in the industry is not on an acceptable level. Internationally the only way in which service provision has been improved, was through the application of a self-regulating system involving penalties paid by the utilities to customers for inferior service.

Policy Position: 45

a) NERSA shall develop and implement an effective system, which must include compensation to the customer, to ensure that quality customer services are provided by distributors.

8.21 Resellers Charges

There are extensive debates on the functions and financial viability of resellers. The key issues relate to the charges of resellers, their responsibilities and whether customers should have the choice to take a supply from the reseller or the licensed electricity utility in the area. It is recognised that the non-cost reflective nature of the tariffs of licensees are part of the reseller's problem. The EPP proposes how this should be addressed which should then alleviate the problem. Real choice would address this issue. However, in practice choice is severely limited and thus the EPP proposes that:

Policy Position: 46

- a) *Non-licensed resellers of electricity shall provide the electricity at terms, tariffs and services not less favourably than that provided by the licensed distributor in the area.*
- b) *NERSA shall provide guidelines to resellers regarding resale principles.*

9 CROSS-SUBSIDIES

There are a host of cross-subsidies in the ESI. Some of these are inherent to the nature of the ESI and tariff-making, but some others exist specifically to subsidise a particular group of customers. There have been extensive debates about these cross-subsidies and what should be done in this respect.

9.1 Cross-Subsidy / MSOE

The EPP makes very clear and gives specific recommendations about how customers should be charged in general. The cost should reflect tariffs within pre-determined, homogeneous, customer categories. This section then provides for a few very specific cross-subsidies which should be/ continue to be applied in the ESI.

Policy Position: 47

- a) *The application of only specifically approved cross-subsidies, subsidies, levies and surcharges must be instituted in the ESI to address certain socio / political / environment needs.*
- b) *Cross-subsidies should have a minimal impact on price of electricity to consumers in the productive sector of the economy.*

9.2 Transparency of Cross-Subsidies / MSOE

One of the disadvantages of applying non-transparent cross-subsidies is that customers often forget about these and very soon more subsidies are demanded. The negative impacts of these cross-subsidies are not always considered in normal decision-making.

Policy Position: 48

- a) *All levies, subsidies and cross-subsidies shall be made transparent, while moving towards cost-reflective and transparent tariffs in the ESI.*
- b) *Licensees are required to establish and publicise the average level of cross-subsidy between customer categories.*

9.3 Future Electrification Capital Subsidies

Sales to low income consumers enjoy special treatment under special circumstances. Linked to this aspect is the high expenditure on electrification assets with an estimated total figure of 70% electrification. For the rural areas this figure is marginally in excess of 50%.

The current State electrification capital fund has already achieved significant success in increasing the rate of electrification drastically without burdening electricity customers too heavily. The electrification fund should be continued as a fiscal grant to target the subsidisation of the electrification capital to ensure that the industry achieve the electrification targets set by National Government.

Policy Position: 49

- a) The subsidisation of capital cost to connect new electrification (neglected communities) customers will be the main mechanism for National Government funded from the budget to achieve the required rate of electrification at affordable price levels.*
- b) As refurbishment / upgrade of these networks are required, consideration should be to include provision for such in the State mechanism.*

9.4 Past Electrification Capital Debt

During 2007 the State started providing grants to fund a major portion of electrification capital costs in South Africa. Prior to this, Eskom and many municipalities funded this capital through their own means and even subsequently municipalities invested significant amounts because of the shortfall in money provided by the State based on the lower priority given to municipal connections relative to the Eskom connection.

This past electrification debt is significant. This debt should be transferred to the REDs. If this cost is pooled for domestic customers only, it would entail very high charges for domestic customers. This matter may be addressed in various ways. National Treasury has indicated that it would not contribute any support. The preliminary EDI Holdings financial modelling indicates that all REDs would be able to carry the existing debts and provide for future capital requirements without raising tariffs above current average levels in each RED. The following thus seems to be the most attractive proposal to address this issue:

Ringfence this debt and create a levy applied to all customers in the RED to repay this debt over a period of say five years. This is in line with what Eskom has done with its past electrification debt. This practice could even be applied by current licensees. If this strategy has a serious impact on the viability of some REDs, a national strategy should be considered.

Policy Position: 50

- a) The capital costs incurred by distributors over and above those funded by State funds to affect electrification must be ringfenced and a mechanism found to address this in a transparent way before and after restructuring, preferably per licensee.*

9.5 Low Income Customer Tariff Subsidisation

The provision of cross-subsidies for low income domestic customers is a foregone conclusion and it is expected that this would be a requirement at least for the next ten years. The following mechanisms will all contribute towards achieving this objective:

- a. the State subsidy towards the network capital cost;
- b. charging of a low connection fee;
- c. charging an appropriate tariff structure that allows for maximum subsidisation at low consumption levels with gradually reducing cross-subsidies as the consumption level increases; and
- d. the granting of FBE.

It is not practical for most licensees to determine who low income customers are. For practical purposes, licensees have been using low consumption levels and low installed capacity as the key criteria to approximate low income. In view of the above the following is proposed:

Policy Position: 51

a) *Qualifying customers shall be subsidised through the application of a life line tariff:*

- *a single energy rate tariff;*
- *with no fixed charge;*
- *limited in capacity to 20 Amps;*
- *supplied with pre-payment / AMR; and*
- *nominal connection fee.*

9.6 Life Line Tariff Level

The determination of the tariff level for the low income customers is the subject of intense political debate. Many municipalities are using this as a tool to win votes, sometimes neglecting important State objectives. There is thus merit in having one life line tariff level with the same conditions associated. This should not necessarily be enforced onto utilities, but could be developed in a high level of detail and be made available with a strong support for all utilities that apply this tariff level. When consumption levels exceed 350 kWh per month it is usually associated with the use of a complete stove and even a geyser. This is then considered not to be a low income household any longer. The life line tariff should thus break even with the cost of supplying a 20 Amp customer at 350 kWh/month.

Policy Position: 52

a) *The level of the life line tariff should be set to breakeven with the cost reflective tariff of the licensee for a 20 Amp supply at a recommended consumption level of 350 kWh per month.*

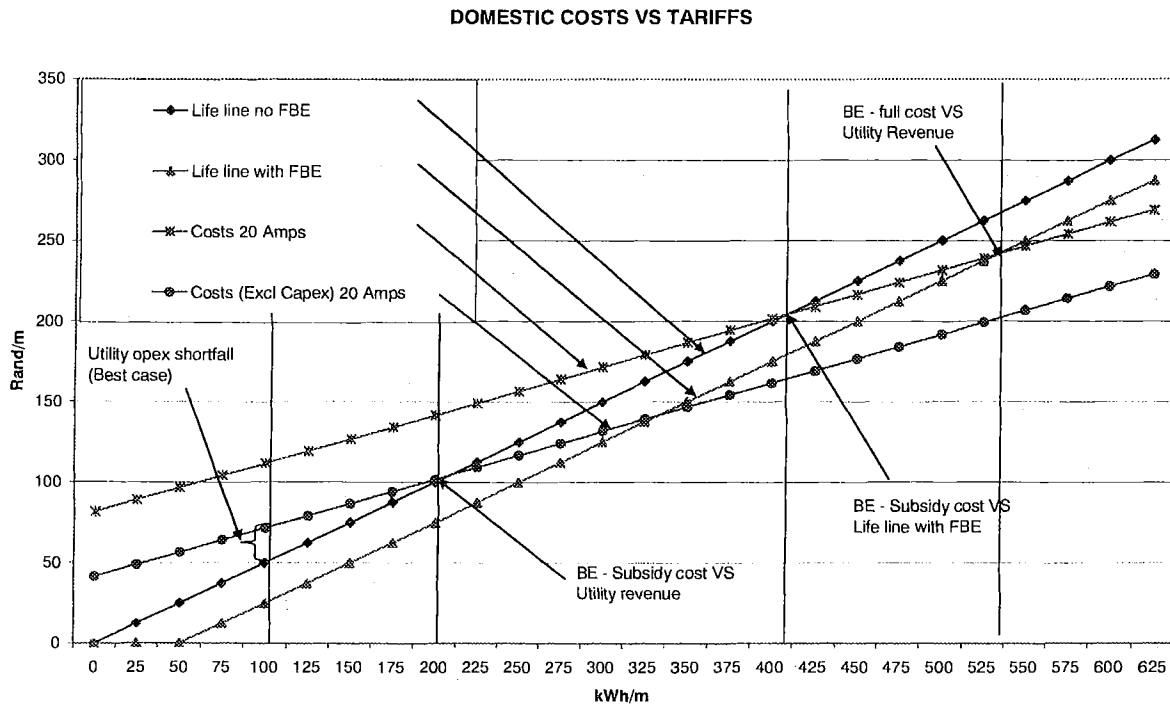
9.7 Life Line Customer Subsidy Impact

Even though Eskom established during the mid 1990s an electrification fund and later the State established such a fund financed through the fiscus, significant amounts of capital were also spent by electricity utilities to fund electrification. This was either:

- a. Before such funds were established.
- b. The funds provided did not cover all costs. In many cases utilities applied very high standards which led to costs exceeding the fund grant received and in other cases the remoteness of supplies required much more money.
- c. In many cases the funds did not match the political requirements in a particular area.
- d. Municipalities also claim that in many cases Eskom was given preferential treatment and thus they had to provide significant amounts of their own funds, whereas Eskom benefited from the electrification fund.

The impact on utilities of the proposed subsidy tariffs are shown in the figure below for the cases with/without capital subsidy and with/without FBE. It shows that even with a capital subsidy and FBE revenue coming from the equitable share to the distributor, there is still a shortfall.

Figure 7: Domestic Costs versus Revenue



It is, therefore, important to formulate policy to determine how these matters should be addressed.

Policy Position: 53

a) *The shortfall in revenue between the life line tariff and the cost of supply after deducting the electrification capital grant shall be addressed within the distributor. The impact of such cross-subsidy must be pooled over all customers in the licensee, not only on domestic customers and should be shown transparently as a c/kWh levy on consumption.*

9.8 Free Basic Electricity (FBE)

The application of FBE is proceeding well and is reaching the target market, but there are certain application problems that need to be continually monitored to ensure that they are applied correctly and are addressing the needs of the low income.

Policy Position: 54

a) *Where LGs wish to apply free electricity in excess of the amount provided for by the equitable share to more customers or for more kWhs, such amount shall be funded by municipal revenue and not from electricity income.*

9.9 State Tariffs

When State usage is subsidised, this practice distorts the ESI and the economy. It is essential that the standard tariffs are charged to ensure that the full cost of providing electricity to the State is known and also to ensure that the appropriate pricing signals are provided to ensure efficient use.

Policy Position: 55

- a) There shall be no special electricity tariffs or terms for the State or State funded institutions including schools and clinics / hospitals. These shall be required to budget for the full cost of electricity services anticipated in the financial year in question. Any subsidies must be procured through inter-governmental transfers.*

9.10 Tariffs on Farms

Electricity tariffs are not necessarily defined by the purpose for which the electricity is used, such as for agricultural or domestic purposes, but rather by cost. To supply electricity to farms is very expensive because of the long distances involved and thus the low utilisation of the network. Over the years utilities have differentiated their tariffs for these customers, but called them either rural tariffs or agricultural tariffs. It really refers to supplies to farms where typically the most economic option would be to supply one or two customers from each transformer. Detailed definitions have been set in NRS 069 which clearly defines the border between the networks to farms and other supplies.

The provision of a subsidised electricity infrastructure for customers on farms, mostly for agricultural purposes, but also for the workers on farms, has been ongoing over the past 30 years. Enough studies have been done to prove that the application of cost-reflective tariffs for farms would have a serious socio / economic impact on the country. Some provision, therefore, needs to be made to ensure that the tariff levels do not increase too much.

One of the biggest problems related to tariffs for farms is the refurbishment costs. Many of the lines were previously funded through an Eskom cross-subsidy on tariffs and in many cases lines were erected by the farmers themselves to keep costs low. Now that these circuits are due for refurbishment, the costs are proving to be very high. If these costs are included in tariff calculations, tariff levels would probably have to increase by more than 100%. Rather than continuing with the practice of having a system of un-transparent cross-subsidy to these customers with the ongoing fear that costs would increase drastically, the following is proposed:

Policy Position: 56

- a) Cost of supply studies must be undertaken featuring pooling strategies which separate significant groups of customers that differ significantly from other customers. One such category which must be treated separately relates to supplies on farms.*
- b) The current cross-subsidy mechanism for supplies on farms must be continued for the time being and the impact shall be shown as a transparent levy in electricity bills where practical.*
- c) DME must undertake a study to consider the introduction of alternative subsidy / cross-subsidy mechanisms to address the challenges relating to farm network replacements. The following option should be considered:*
- The establishment of a farms' network refurbishment fund either be financed through:*
- State allocation managed by the Department of Local Government or the Department of Agriculture and Land Affairs.*
 - A RED electricity levy applied at the RED level and it thus managed by the RED.*
 - A national electricity levy applied at the wholesale level and thus managed by DME / agent of DME.*

9.11 Municipal Surcharge on Electricity (MSOE)

Currently a significant amount of electricity revenue is used by many municipalities to subsidise other municipal services. This is done by way of a transparent so-called "surplus," but also by way of various un-transparent methods such as: provision of streetlights, overstated administrative charges, unfair surcharges on materials handling and understated internal usage charges. Until municipalities have completely ringfenced their activities, overstated charges to electricity departments will probably continue.

The MSOE will be regulated through norms and standards for electricity surcharges (as and when introduced) as provided for in the Municipal Fiscal Powers and Functions Act. When regulations on electricity surcharges are introduced, the regulation of the "base tariff" will be the responsibility of NERSA (which will be exclusive of the electricity surcharge) and the Minister of Finance / National Treasury will be responsible for the regulation of the MSOE.

Some municipalities have already introduced a transparent MSOE without phasing out the existing hidden surpluses. This is totally against the intention of the legislation to regulate the application of the MSOE. Furthermore it is also uncertain as to whether these municipalities have ringfenced their activities in order to quantify the hidden surpluses.

Policy Position: 57

- a) *Under no circumstances shall the new MSOE be introduced in addition to the current non-transparent / un-ringfenced surpluses.*
- b) *The electricity service by municipalities should be ringfenced properly before the introduction of the proposed new MSOE.*
- c) *NERSA shall regulate the electricity prices excluding the transparent MSOE.*

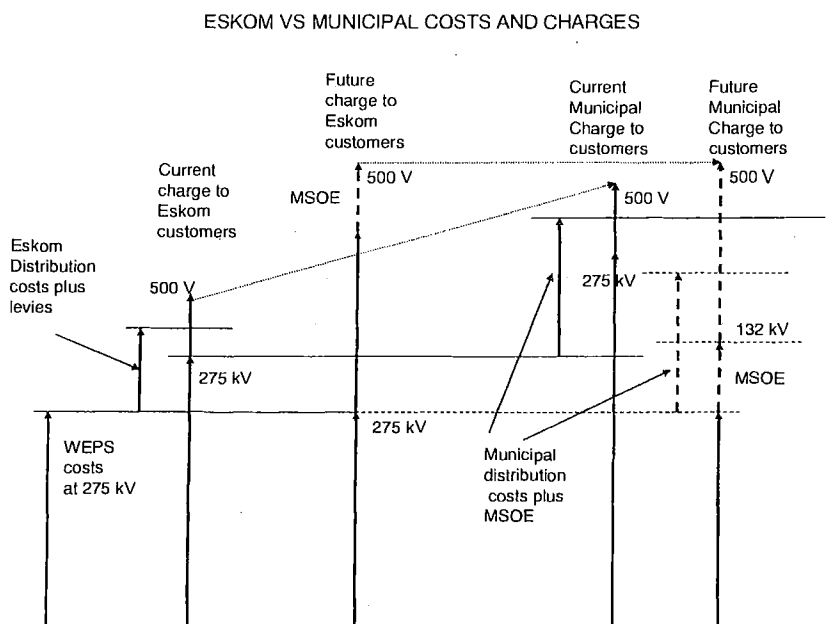
Many of Eskom's large customers are overcharged and they cross-subsidise other customers, specifically at lower voltages. The new Municipal Fiscal and Powers Act provides for the application of a MSOE on electricity customers of Eskom who fall within the area of jurisdiction of the LG. It is strongly recommended that these large customers mostly supplied at high voltage, many of them competing in export markets, should not be exposed to MSOE without first rectifying the current tariff overcharging.

Policy Position: 58

- a) *The phasing in of MSOE on non-municipal electricity customers who are currently being overcharged, should be matched by the phasing out of current overcharging of these customers as a result of existing cross-subsidies so as to avoid any unfair overcharging / MSOE burden on these customers.*

The challenges facing the ESI in respect of the MSOE together with the problem of the non-cost reflective Eskom voltage differentials are illustrated in the figure below.

Figure 8: Future Treatment of MSOE and cost reflective Eskom Charges



Municipalities apply the rule of cutting off or not selling pre-payment electricity as a measure also to recover municipal rates revenue. In areas where this is not done the rates payment levels are very low. In a REDs scenario municipalities would face a situation of a serious non-payment of rates and, therefore, provision needs to be made to prevent this eventuality.

9.12 Viability Assistance

With the forming of REDs it is possible that some of the REDs would not be viable initially at least without raising tariff levels excessively. Significant amounts of capital and operating costs would be required to catch up on some of the maintenance, refurbishment and expansion backlogs. In the case of Eskom, significant amounts of capital are required to fund the massive generation expansion. As the owners of the public entities, new capital should be funded by the owners through a combination of debt and equity. The State should thus forfeit the receipt of any dividends for some time and may even need to inject some capital into the entities. As with any other private entity, the State should in time receive a return on its investment.

Policy Position: 59

a) *The State, as the owner of public entities, must consider forfeiting dividend payments and even MSOE and must make equity investments, if needed, to assist electricity utilities to retain their tariffs at economic levels while incurring capital expenditure for the expansion and refurbishment of existing networks to ensure appropriate gearing ratios and business indicators.*

10 DEMAND SIDE MANAGEMENT / ENERGY EFFICIENCY

Current electricity usage behaviour is based on many distortions. These have caused usage behaviour that is increasing costs significantly and causing immense environmental damage. Some of the key distortions are as follows:

- a. The very low electricity prices in general.

- b. The substantial subsidies to domestic customers.
- c. The mindset that an all electricity home is the only option.
- d. The political agenda that all should receive the same.
- e. Massive electricity non-payment and theft.

Some of the undesirable patterns of behaviour caused by the distortions are as follows:

- a. There is a general wastage of electricity by all groups of customers.
- b. There is almost no recovery of waste energy for electricity generation or re-use in plants.
- c. Space heating and cooking are done with electricity rather than with alternatives, causing 400% more pollution.
- d. The scrapping of options such as clean, de-smoked, coal projects.
- e. Conversion from coal stoves / water heaters / space heaters to electricity rather than clean coal.
- f. Use of electricity for water heating without any solar support.
- g. Swimming pools using electricity for water heating, rather than solar installations.
- h. Building of factories, businesses, shops and houses with very little consideration for efficiency and the environment.
- i. RDP houses being built as energy drains, e.g. not facing north, no big windows to the north for good light and heat and corrugated iron roofs without any ceilings or added insulation.
- j. Practice of handing out two plate electrical stoves and electrical space heaters.

This section addresses the key policies which need to be applied to ensure that energy is used in the most effective way considering the broader environmental and economic impact and that loads are used in the most appropriate time of the day and year.

10.1 Pricing Signal

Questions about the relationship between tariffs being driven by cost reflectivity versus being a pricing signal are raised regularly. It is recognised internationally that cost reflective tariffs, as reflected by LRMC representing the true economic cost, are the best price signal. Whenever deviations from cost are applied as a measure to achieve a specific objective the economic signal would be distorted which could in turn lead to inefficient allocation of resources in the economy.

Policy Position: 60

- a) *Cost reflective tariff levels and structures as discussed in the EPP shall be the first main driver of DSM and efficient use in the ESI. For this reason unbundled cost reflective charges must be charged to customers.*
- b) *This is to be applied as one of the NERSA tariff evaluation criteria.*

10.2 Utility DSM / Energy Efficiency Revenue Impact

The application of DSM and energy efficiency measures in the ESI is a reality in terms of various objectives. It is a fact that when utilities implement energy efficiency and DSM, these would cost them money to do so and they would lose revenue which could thus affect their viability. This would, however, save utilities some purchase costs and significantly influence network infrastructure upgrades.

NERSA needs to take cognisance of all these factors in determining the revenue requirement and thus future price increases of utilities.

Policy Position: 61

- a) *NERSA must include the impact of DSM and energy efficiency on increased implementation cost, reduced revenue and reduced network capital expenditure in determining its utility revenue requirement. As with all other costs and revenues, licensees will have to submit the detailed DSM and energy efficiency programmes with the cost and revenues implications as part of their annual price increase proposals.*
- b) *These implications must also be ringfenced and be reported on annually by licensees.*

10.3 Domestic DSM and AMR

The domestic sector, which contributes more than 35% of the total system peak demand, presents very significant DSM and energy efficiency opportunities. Very little is, however, done to achieve this. The following factors have caused this state of affairs:

- a. Heavily subsidised rates.
- b. Very few tariffs with capacity limitation.
- c. Almost no tariffs with TOU pricing signal.
- d. No emergency pricing signal or systems.
- e. Very high non-payment and theft in many areas.

Certain practices and the required support systems are applied in other parts of the world with substantial success. The application of AMR for domestic customers, linked with sophisticated AMR and DSM and utility control systems on an integrated basis, should receive serious consideration in South Africa.

Policy Position: 62

- a) *Sophisticated TOU tariffs with dynamic emergency price signals, DSM and load management features with support of smart meters on an integrated basis must be planned for rapid implementation where economically viable and practical. Mechanisms for special funding for this purpose need to be made by DME.*

These measures will facilitate the following behaviour:

- a. Load shift from high demand periods to low demand periods.
- b. Reduced consumption because of high prices by:
 - Energy efficiency measures.
 - Efficient behaviour.
 - Energy switching to alternative energy forms.
- c. Reductions during emergencies.
- d. Reduced losses and increased service.

10.4 Emergency Measures for Capacity / Energy Shortages

The capacity shortage situation in the country is a serious threat to the economy. Provision should be made to ensure that this is rapidly eliminated and prevented. Such provision should cover issues to be considered by the utilities and customers. Action taken in this respect in Brazil had the desired impact and in fact exceeded expectations.

During times of serious power shortages two new types of costs start to play a role:

- a. When serious shortages are being experienced the cost for customers to run their own back-up generation plant.
- b. During interruptions the cost of unserved energy reflects the impact on the economy of such shortages.

These costs should thus be used in setting penalty / pricing signals during these times and not be based on some arbitrary charges. This would ensure that those customers who do not save according to the targets would feel the same financial impact than those customers whose supplies are interrupted because of their actions.

Policy Position: 63

- a) *The industry must apply emergency measures to avoid the interruption of groups of customers because of shortage of supply.*
- b) *Power rationing and similar measures must be applied to obtain mandatory reductions in power usage to such level to match supply and demand with the following provisions:*
 - *Penalties in price and/or interruption must be applied to those who do not reach their targets.*
 - *Those who do not reach the targets must be charged at the variable cost of a diesel fired open cycle gas turbine.*
 - *To limit the economic impact of ongoing industrial load reductions more dynamic price options, such as a TOU tariff with a super peak rate during times when interruptions are effected, should be offered at the COE applicable to rationing quantities not saved.*
 - *Mechanisms to encourage economic growth in line with system availability must be incorporated*
- c) *NERSA must investigate a mechanism to link charges payable by customers to the quality of supply in cases where it moves outside of the accepted norms and standards, e.g. Capacity Charge = MW x MD Charge x (Actual supplied/Max Target hours)*
- d) *NERSA must ensure that ongoing power interruptions because of capacity / energy shortages feature in the performance management systems of licensees and its management.*

10.5 DSM / Energy efficiency funding

The application of DSM and energy efficiency strategies has gained momentum with the recent power shortages in South Africa. Eskom has been managing the DSM / Energy efficiency fund, which is funded from a portion of the Eskom budget. The Minister of Finance recently announced the application of a 2 c/kWh levy on non-renewable generation in South Africa. It is unclear for which purpose the funds would be used. The need for money to fund various DSM / Energy efficient and renewable energy sources in South Africa is extensive and urgent and this includes *inter alia* the following:

- a. Smart meters for domestic customers over 500 kWh/m.