Strategic direction and tariff design principles for Eskom's tariffs 2017

Contents	Page No.

2017 STRATEGIC DIRECTION AND TARIFF DESIGN PRINCIPLES FOR ESKOM'S STANDARD TARIFFS

EXECUTIVE SUMMARY

This document sets out Eskom's strategic direction and objectives for its electricity tariff structures over the next few years, in order to provide stakeholders with a view of Eskom's long-term plan of action for tariff structures and the aims that the development of these tariffs intends to achieve. The pricing strategy[1] was last updated in 2006, see Appendix C for a summary of the previous strategies proposed and achieved.

Pricing strategy is about determining where tariff design and structure should be heading taking into account the changing business environment. In a deregulated market, pricing strategy will be a lot more flexible, but as Eskom's is regulated, pricing flexibility is subject to what national policy will allow and Nersa's interpretation of the policy through regulation.

The following have been identified as the most significant drivers for developing a strategic direction for tariffs design and structures and where Eskom needs to move towards:

Drivers (where are we today?)	Consequences (if we do nothing?)	Proposed interventions (where do we want to be?)
• Need for updated integrated pricing strategy going forward	• Isolated tariff development	• Create a coherent tariff strategy to inform future tariff development • Inform and allow for customer inputs • Address the changing business needs and operating environment
• Need to change the regulatory framework	• Unable to respond to the short term demands or request	• Investigate and propose tariff development framework and approval process for dynamic and flexible tariff
• Need to accommodate the evolving customer and technologies	• Reducing sales as customers moving off grid • Introduces complexities in managing the system • Increases costs and risk for Eskom	• Develop cost-reflective tariff structures • Provide options that optimise the use of the system and benefit the customer
• Need to sustain sales growth	• High price increases if not achieved • Stranded assets • Viability • Incentivises competitive forces	• Implement customised and dynamic tariffs • Recover fixed cost through fixed charges instead of variable charges

Following from the understanding of the above drivers, the strategic objectives for tariffs are as follows:

- Tariffs to be more cost-reflective in structure i.e. fixed versus variable charges and in level
- Tariffs that share volume risk between customers and Eskom and allow Eskom and the customer to partner for mutual benefit.
- Tariffs must ensure fair compensation for the use of the grid by generators and loads
- Tariffs that incentivise customers to stay connected to the grid.

[1] Note that any references to "***pricing strategy***" in this document deal with tariffs, tariff design and tariff structures. They do not deal with future price paths and price increases. However tariff changes may impact revenue which in turn may impact price increases to some or all tariffs.

- Tariffs that increase sales and ensure adequate recovery of costs
- Tariff that enable better management demand and supply.

These strategic objectives align with the Corporate Plan as set out below:

Corporate Plan Strategic Pillars	Description	Proposed initiatives
1 Customer-centric organisation	▪ New customer interaction modes ▪ More customer choice	• Provide tariff products that are more adaptable to the changing competitive environment and customer needs and that provide a benefit to all customers
2 Reliability & availability of power	▪ Continuous availability of power energy at all times	• Establish dynamic tariffs and market tools that support a power system and positively influence supply and demand
3 Efficiencies in operating and capital cost	▪ Getting bang for buck	• Take into account the best interests of the country, provide signals to increase efficiency and reduce the overall cost of electricity, thus improving the country's competitiveness
4 Decarbonisation of the economy	▪ Reduce high carbon intensity technologies	• Achieve a sustainable industry for all participants in the electricity industry i.e. the producers of electricity, the movers of electricity (Distribution – Eskom and municipal Distribution and Transmission), the sellers of electricity and all end-use consumers.
5 Innovation and transformation	▪ Introduce new and effective ways of operations ▪ Create an inclusive business environment	• Provide tariff products that are more adaptable to the changing competitive environment and customer needs and that provide a benefit to all customers.
6 Funding plan and key enablers	▪ Obtaining required funding for the business requirements ▪ Levers that enables business growth	• Reflect as far as possible cost drivers and allow for signals that incentivise efficient use of resources (energy, networks and retail)
7 New capabilities	▪ Put in place new skills	• Take into account potential disruptors, threats and opportunities

These strategic objectives will further guide the design principles in the determination of tariffs. The design principles will address the following aspects:

- Revenue neutrality
- Structural adjustment and the MYPD process
- Retaining sales and encouraging growth
- Energy charges
- Lifeline tariffs
- Distribution use-of-system charges
- Transmission use-of-system charges
- DUoS and TUoS charges for wheeling
- Grid-tied and net-energy billing
- Retail charges
- Alignment of rural tariffs'
- Subsidies

Eskom believes that the principles and goals set out in this document will send the correct pricing signals for a viable electricity industry, providing a sound and justifiable foundation for electricity tariffs and aligning with the South African Grid Code, the Distribution Code, and the Department of Energy's (DOE) Electricity Pricing Policy (EPP).

These strategic direction and tariff design principles and objectives attempt to achieve the most appropriate balance taking into account customer needs, practicality, affordability (subsidies paid and received), the changing energy environment, Eskom business needs and government policy.

1. INTRODUCTION

In 1999, Eskom developed its first strategic pricing direction in which specific goals were set for Eskom's standard tariffs, which was followed by the 2007 version. This is the third edition of Eskom's strategic pricing direction.

The purpose of this document is to set out the strategic direction and tariff design principles for Eskom's tariffs over the next five years, the details of which are to be dealt with in subsequent retail tariff restructuring plans and tariff submissions. This strategic direction and principles document does not deal with price levels, as these are determined through the multi-year price determination (MYPD) process.

Tariff structural changes are done on a revenue-neutral basis; that is, the sum of all the changes to the tariff charges multiplied by their component volumes must equal the revenue requirement. Structural changes could, however, impact the average price for individual tariffs or individual customers within a tariff. It is not possible to make changes to tariffs without impacting some customers negatively or others positively. The pace for achieving the objectives and goals contained in this document will depend on inputs from all stakeholders and approval by Nersa.

Tariffs are the formulae used for the recovery of a utility's revenue combining volume (kWh, number of customers, kVA etc.) and rates (c/kWh, R/customer. R/kVA) for each tariff and customer category, and therefore need to be structured to recover this revenue adequately, both in terms of the level of the rates and in the combination of different charging parameters that will recover the revenue. Goods need to be priced at the level that provides the optimal economic use of the goods. If prices are set too high above the value of the goods, the result will be an unwillingness to use the goods or an inability to afford the goods. Yet pricing goods too low creates wastage and is an uneconomic use of the goods. To provide the correct pricing signals therefore the level should be correct, but that the tariff should also reflect the nature of the costs i.e. the cost causation.

It has to be recognised that there is a changing business environment, in particular competition from distributed generation sources, storage and technology advances in the energy space. The environmental factors will influence the way we operate, the way energy is planned, the energy mix, the plant mix, how plant is dispatched, customer consumption patterns and what we do to remain sustainable. This document will look at the tariffs, pricing strategies and design principles taking into account the game changers facing this organisation and other utilities around the world.

Tariff design flows from a properly segmented cost-of-supply study i.e. a good understanding of the cause of the cost. Once the costs have been understood and allocated, they can be aggregated into categories driven by the same cost driver. Thereafter, tariffs can be designed and scaled to take into account stakeholder needs and to ensure revenue neutrality (i.e. the sum of all the tariff components cannot be more than the Nersa approved revenue requirement) and subsidy requirements. There is, however, no standard formula that can be used to design a tariff. Many factors must be taken into account in determining a suitable tariff, such as:

- National policy and rules
- Customer behaviour and competition
- Current price and impact on customers
- Business risk
- Affordability
- National policy and regulation
- Implementation practicality
- Simplicity for customers
- Learning from International best practices

It is impossible to satisfy all these factors equally, but it is important to have a framework that guides the development of tariffs into the future. Also refer also to Eskom tariff design methodology document[2] which explains the cost of supply and tariff design process.

[2] Can be found at http://www.eskom.co.za/CustomerCare/TariffsAndCharges/Pages/Pricing_Documents.aspx

2. TARIFF DESIGN PROCESS

The strategic direction and principles are required to guide the tariff design process, as described in the following figure. Central to the tariff determination process is the development of strategic objectives.

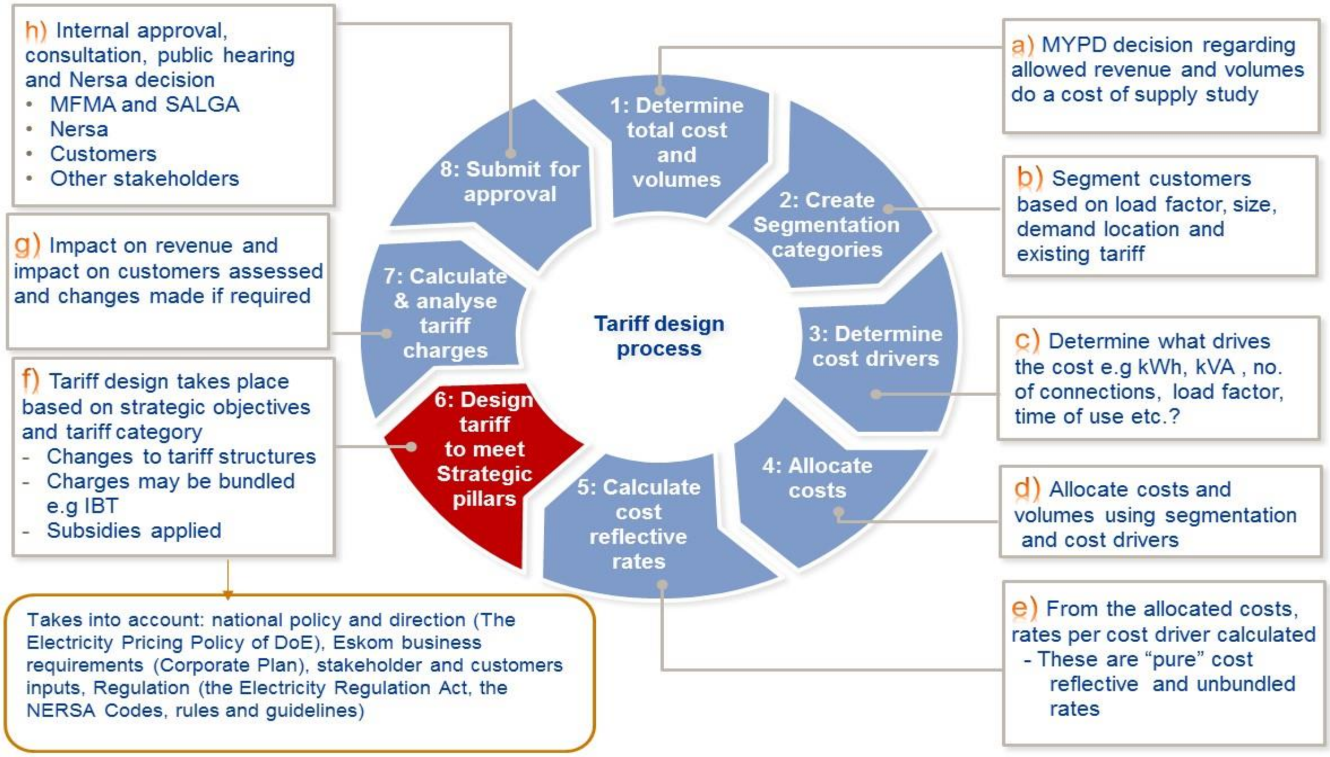

Figure 1 - Tariff design process

There are different stakeholders whose needs also provide the drivers for tariff changes and these must therefore be considered in determining tariffs. These stakeholders are the government, the business needs and the customers. The biggest challenge is to balance the needs of one stakeholder against the needs of another stakeholder and still achieve the pricing objectives that ensures a financially sustainable organisation. Refer to Appendix A – National policy, where the policy guiding tariff development and design is referenced.

3. DRIVERS DIRECTING THE STRATEGY AND TARIFF DESIGN PRINCIPLES

The following have been identified as the most significant drivers in tariff design going forward:

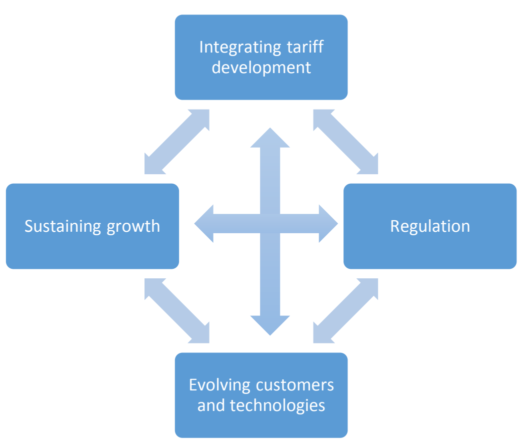

Figure 2: Game changers directing the pricing strategy and tariff design principles

All of these drivers are interlinked sustaining growth is impacted by evolving customers and technology which in turn is impacted by Regulation.

3.1. UPDATING OF ESKOM'S STRATEGIC PRICING DIRECTION

In 1999, Eskom developed its first strategic pricing direction in which specific goals were set for Eskom's standard tariffs, which was followed by the 2007 version[3]. This is the third edition of Eskom's strategic pricing direction. These documents aimed to achieve:

- The 1999 version's main focus was on unbundling charges and introduction of network charges
- The 2009 version key focus areas were:
    - Further unbundling of Transmission and Distribution charges
    - Revising the TOU tariffs
    - Later introduced updated NMD rules, charges for generators and some new tariffs
- All of the above were published externally and provided to Nersa for noting – not approval.

Eskom therefore developed tariffs that were guided by the strategy set out in the above documents, but there is now a need to update the pricing strategy to guide future developments to address all the drivers for change. The Eskom Corporate Plan, technology and the evolving energy industry necessitate an integrated tariff strategy to ensure a sustainable operating business model.

As Eskom is required to be revenue neutral when making tariff changes, a reduction of the tariff of one customer or a tariff charge will mean an increase in the tariff of another customer or an increase of another charge. As Eskom does not serve only one customer category, Eskom must, to the best of its ability, design tariff structures and rates that address the interests of all customers as equitably as possible.

3.2. REGULATORY FRAMEWORK

The next driver is the current regulatory framework and what needs to change to allow more dynamic and customised pricing.

The current regulatory framework limits the ability of Eskom to offer flexible and innovative pricing options in response to shorter-term business needs e.g. excess capacity or shortage of capacity in certain hours of the day. This limitation is caused by the long-lead time approval process and also being required to always be revenue neutral.

The Electricity Regulation Act states:

> *15 (2) A licensee may not charge a customer any other tariff ….other than that determined or approved by the Regulator as part of its licensing conditions"*
>
> *3) Notwithstanding subsection (2), the Regulator may, in prescribed circumstances, approve a deviation from set or approved tariffs*

The consequences of only being allowed to offer standard tariffs that follow the current regulatory approval process, is that this limits the ability of Eskom to offer short-term, customised and dynamic pricing options to be able respond to immediate business dynamics e.g. excess capacity or shortage of capacity in certain hours of the day. In order to allow for dynamic and customised flexible tariffs, the regulatory framework need to allow for flexibility in tariffs e.g. provide a mechanism that combines a suite of standard tariffs and more dynamic tariff offerings and that the revenue impact managed through changes to the MYPD rules (over and under-recovery.

There therefore needs to be a regulatory framework and mechanism that enables more flexible tariff options to be offered. This could include take-or-pay tariffs where the customer pays for fixed volumes and pay a price that reflects providing this certainty, and then buys excess or sells surpluses through a more flexible tariff regime or even a market.

[3] Refer further to Appendix C – Summary of the previous Strategic Pricing Directions

3.3. EVOLVING CUSTOMERS AND TECHNOLOGY

The customer's goal is to obtain the best value for money by purchasing electricity as cheaply and as efficiently as possible. Affordability and technology developments will be the biggest factors influencing customers going forward.

- Affordability
  - The customer's goal is to obtain the best value for their money by purchasing electricity as cheaply and as efficiently as possible.
  - International competition for markets – part of global companies that only "dispatch" the lowest costs plants
  - Customers are also becoming more conscious of energy efficiency and are exploring alternative energy sources that will compete with Eskom sales.
  - Customers also want more flexibility with the tariffs and may be prepared to partner in schemes that provide mutual benefit to them and Eskom.
- Technology developments
  - Increasing improvements in technology resulting in increasing efficiencies
  - Changing demand
  - Smarter management of demand
  - Electric vehicles

Customer are also becoming more conscious of energy efficiency and are exploring alternative energy sources that will compete with Eskom sales. Customers want more flexibility with the tariffs and are prepared to partner in schemes that provide mutual benefit to them and Eskom. Affordability is also playing a role with companies that compete internationally and decisions get made to "dispatch" the lowest costs plants.

Distributed generation, especially PV plus battery storage (storage includes the impact of electric vehicles) is changing how customers purchase energy and the way utilities operate. Customer now a have choice of electricity supply and thus utilities face competition from other suppliers of energy. This is largely being driven by decreasing costs of PV and battery storage.

Supply of electricity is also moving away from large-scale centralised production of power to a more localised and bi-directional flow of energy. This changes the way the grid needs to be designed and developed and how tariff charges for this new use are to be raised to ensure fair and equitable recovery of costs.

Due to this competition there will be some natural attrition of sales from existing customers and greater choices for new entrants. This impacts revenue certainty and changes the way tariff need to be designed.

There is no longer the need to provide renewable subsidies through very high feed-in-tariffs due to the decreasing cost of PV and storage. Utilities around the world are reducing feed-in tariffs and compensation rates for net-billing schemes. According to research done by Eskom on international trends, solar PV costs are projected to decrease at approximately 8% to 9% per annum until 2020, as shown in the following figure[4]:.

[4] Source, Eskom Research, Testing and Development, Projecting the Cost of Small Scale Solar PV in South Africa: 2016-2020, Dr Ulrich Minnaar & Wilhelm Bisschoff, 2016

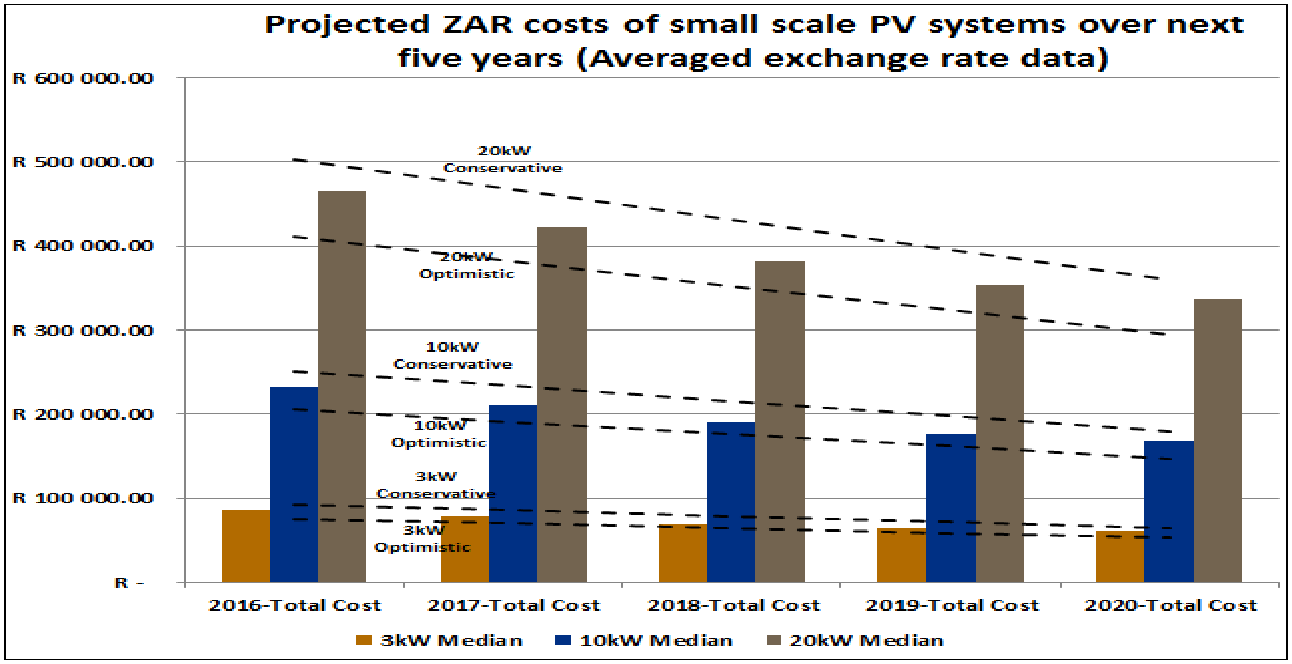

Figure 3- Decreasing cost of PV

Regarding storage it is predicted that that there will be a 40% to 60% price plunge for certain battery technologies by 2020 (source AECOM, Australian Renewable Energy Agency):

- Economic drivers include tariff avoidance, time-of-use arbitrage, protection against blackouts, and network investment return.
- Worldwide the total amount of energy storage, discounting the electric car market, could reach 240 GW by 2030 with batteries as the dominant technology (source Citigroup)

However, storage will not be able to reduce peak demand where there are extended periods of no sun due to limited battery life.

What is being raised by utilities is fairness and proper compensation for use of the grid, to move to tariffs that reflect cost drivers more accurately and regulators are being put under pressure by these utilities to increase fixed charges and protect customers without PV. Customers and lobbyists for solar energy, however, argue that utilities are creating barriers to entry and a threat to clean energy. The challenge is how to balance the needs of the utility against those with PV and how to change a threat into an opportunity.

Alternative energy use will require:

- tariff structures to reflect cost causality more accurately;
- utilities to ensure fair compensation for the use of the grid;
- identifying and costing the impact of PV and storage on networks and managing the system;
- incentivising customers to stay connected to the grid; and
- changing the operating models to mitigate the impact on the business (for example, own and operate rooftop PV) and the use of storage, including electric vehicles.

Berkeley Research[5] states that in historically the USA, energy efficiency policies and programs have had a greater impact on electricity sales than distributed solar and that energy efficiency impact on sales will likely continue to

[5] Galen Gabose. Putting the Potential Rate Impacts of Distributed Solar into Context, Energy Analysis and Environmental Impacts Division Lawrence Berkeley National Laboratory

outpace distributed solar, though less than in the past. The impact on sales, therefore, of customers pursuing energy efficiency in the light of rising prices cannot be discounted. Eskom therefore needs to make sure that customer's derive value from our products and that they continue to use our products.

The introduction of renewable energy adds new challenges to managing the supply and demand on the power system, with a lot of conventional non-peaking plant and a demand profile that is not aligned with the PV production profile. Typically, there will be an overcapacity of supply in the middle of the day and a sharp ramp-up of demand as the sun goes down. This causes the system profile on an average day to look a little like the back of a duck and is, therefore, called the "duck curve".

This kind of curve is very difficult to manage where there is excess generation, with a power station fleet that is largely base-load coal, as these plants do not have the ability to temporality shut down or reduce output beyond a narrow operating envelope once synchronised. There are also plants that are must-run plants needed for voltage support and reliability. These plants do not have the ability to ramp up quickly when demand increases; they need time to synchronise or increase production to support this ramp-up. These issues are the technical and economic limits of a shared power system that needs to be managed for the benefit of all customers.

The biggest cause of this ramping is residential load. The following graphs illustrate the profile of a residential customer on a particular day before and after PV. In this case, the customer will go negative, that is, actually export energy onto the grid. This export may be at a time when there is excess supply of energy.

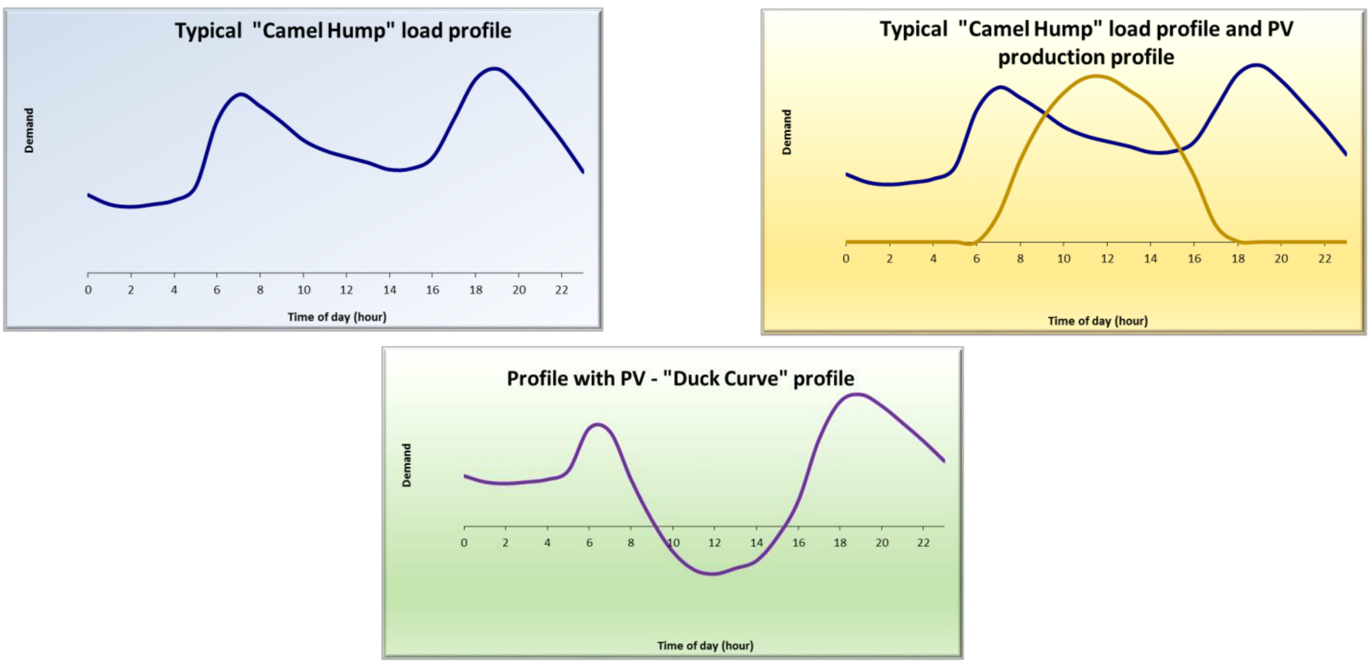

Figure 4- Load profile changes due to PV

In addition to managing supply and demand, in South Africa, the renewable plants that are part of the government REIPP programmes are not dispatchable, and if curtailed by the System Operator, deemed energy payments have to be made. This means that there could be suboptimal dispatch and curtailment of plants, i.e. running of more expensive renewable plants and shutting down or reduction of supply from cheaper generation sources at times that vary through the day and the year.

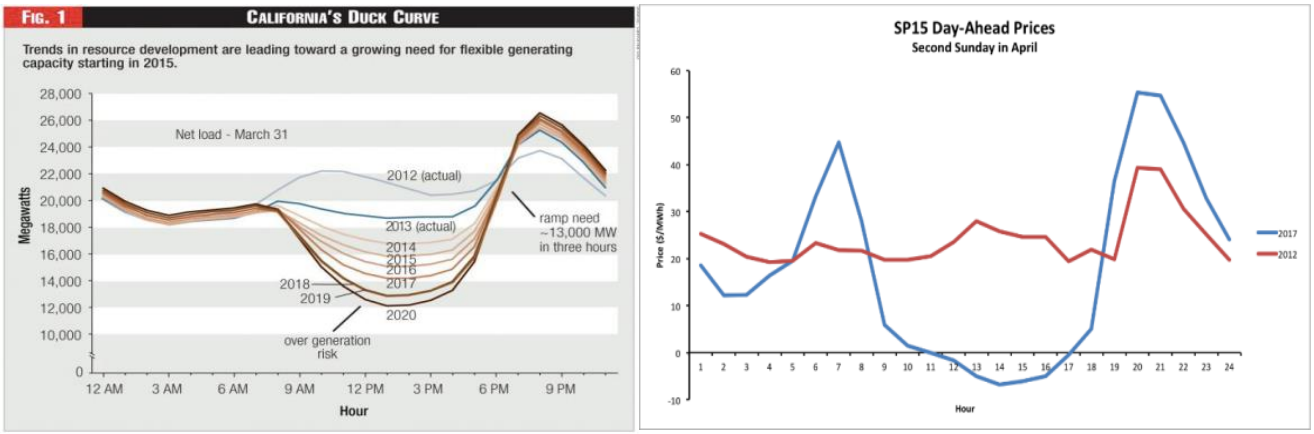

Figure 5- California system changes due to PV

The above graphs [6] shows the changes to the California system profile over time due to the increasing PV penetration and how the day-ahead market is used to manage the profile. It can be noted in 2017 that at times the market energy price goes negative and that the shape correlates with that of the system profile.

These issues together are the technical and economic constraints in a power system where there is a lot of renewable energy that does not necessarily match demand. Economic signals can be introduced to manage this risk more effectively, and this can be done with the help of customers through tariffs that support higher demand in the excess generation periods and less demand in the ramping periods. This document will look at pricing strategies that could be utilised to assist in managing the duck curve, such as:

- TOU tariffs for residential being mandatory;
- net-billing rates incentivising storage for use in peak periods;
- introducing demand charges in ramping periods;
- dynamic pricing and enabling technologies (management of equipment by the System Operator) to better manage demand and supply; and
- reduced prices for periods when there is excess capacity.

3.4. SUSTAINING SALES GROWTH

Eskom's sales since 2007 has no shown growth. This has mean due to a number fo factors such as commodity prices being low, downturn in the economy, increased energy efficiency and lately due to factors such as PV and embedded generation adoption. Reduced sales even with no increase in costs can cause tariff increases represented by the following figure commonly referred to as the utility death spiral:

[6] Source: SOURCE: California ISO www.caiso.com

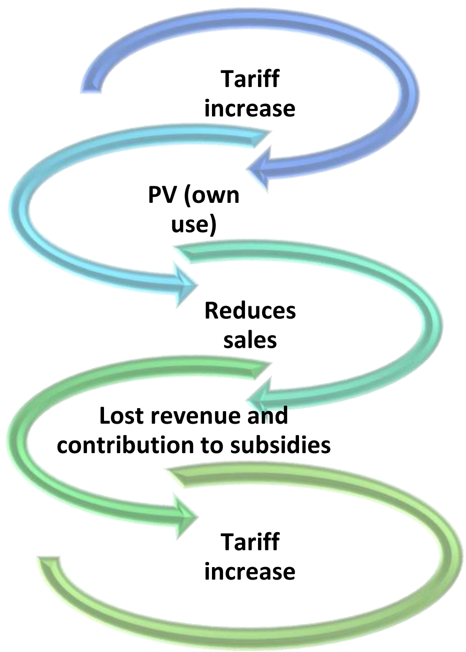

Figure 6- Utility death spiral

This reduction is sales can result in lower revenue that is not commensurate with lower costs. This lower revenue is usually from customers who also contribute to subsidies, resulting in further lost contribution to subsidies. In order to balance this against cost and lost subsidies, the utility has to increase tariffs. This provides a greater incentive for customers to install PV or to become more energy efficient, resulting in a feedback loop of increasing prices and lower sales.

The average Eskom selling price adjusted for inflation compared to annual volumes, shown below, reflects the impact of sharp price rises driven by increasing costs. Since 2008, the energy volume has shown a decline. Some of this decline would be as a result of a response to rising electricity prices.

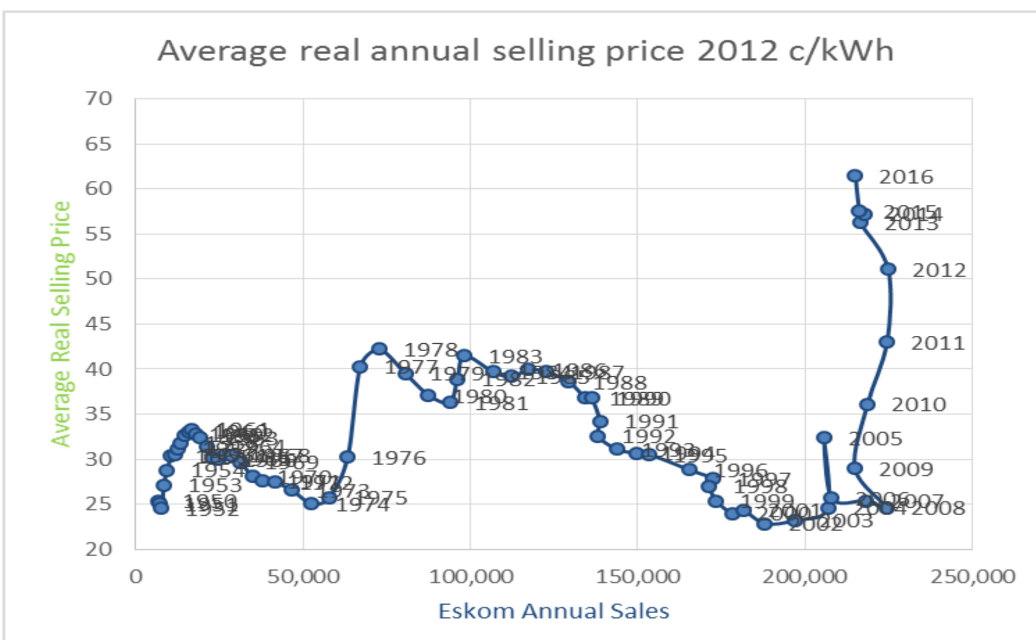

Figure 7- Average real electricity prices 1952 - 2016

However, the question is whether the utility death spiral is fact or fiction, a real threat or greatly exaggerated, and how much poor tariff design plays a role, that is:

- charges do not reflect cost causation, for example:
  - costs are not always known or understood;
  - traditionally simple tariffs, with the recovery of fixed costs (network and retail) through volumetric-based charges (c/kWh);
  - the use of inclining block tariffs, which provide no TOU signal and greatly incentivise higher-consumption customers to use alternative energy sources or reduce sales through energy efficiency, resulting in a real revenue loss not commensurate with a real cost reduction; and
  - recovery of affordability subsidies in tariffs, which increases the price of electricity to those that can afford to pay the subsidies, providing an additional incentive to use alternative energy sources; and
- tariff structures giving the wrong economic signals, for example:
  - net-metering/billing rates overcompensating – not reflecting the economic value of PV by compensating at higher than the avoided costs of the utility;
  - the wrong incentive with inclining block tariffs;
  - limited signals for actual demand customers impose on the network;
  - lack of TOU signals for energy consumed (and exported); and
  - unfair distribution of subsidies – those with PV being subsidised by those without.

Storage is another factor that could hasten the utility death spiral if storage is not managed for mutual benefit of both the customer and utility. The pricing strategy should aim to address the following:

- What can be done to increase sales and ensure adequate recovery of costs?
- How can customers be incentivised to stay connected to the grid?
- How can the utility and the customer partner for mutual benefit, such as the use of storage (including electric vehicles).
- Should Eskom's strategy be to recognise the effect of the utility death spiral and to start developing products that can mitigate this risk?
- Is Eskom's role to incentivise own-use deployment of PV or should it be to design rates that keep the grid and the system whole and provide the correct economic signals or to combine elements of both?

Based on all these game changers, this document proposes Eskom's 2016 strategic pricing direction and principles as follows.

4. STRATEGIC OBJECTIVES FOR TARIFFS

In summary he industry structure is expected to evolve over time and this will depend on the policy and regulatory environment set by government. Eskom must develop tariffs that:

- Enables the economy to grow. The tariffs and tariff structures need to evolve to accommodate changing customer needs and a potential competitive environment (efficiency and distributed generation).
- Address market conditions and provide a benefit to all customers.
- Provide customers with more information regarding the value of the product they are getting – using the grid as storage as opposed to buying a battery, standby capacity provided etc.
- Balance revenues and risk and ensure adequate recovery of cost
- Flexible enough to enable customers to respond to short-term requirements (act like a pseudo-market?). This is needed so as to incentivise sales growth while giving customers the opportunity to maximimse the value of the electricity.
- Are accommodated in an enabling regulatory environment and national framework to be able to make changes to tariffs easier and more flexible and to keep pace with a more competitive market.
- As far as possible balance the needs of all customers in a fair and equitable manner.

Following from the understanding of the above and the drivers, the strategic objectives for tariffs are:

Tariffs to be more cost-reflective in structure i.e. fixed versus variable charges and in level

Tariffs that share volume risk between customers and Eskom and allow Eskom and the customer to partner for mutual benefit.

Tariffs must ensure fair compensation for the use of the grid by generators and loads

Tariffs that incentivise customers to stay connected to the grid.

Tariffs that increase sales and ensure adequate recovery of costs

Tariff that enable better management demand and supply.

Eskom is only able to achieve these objectives if approved by Nersa and this approval will be done within the current confines of the regulatory environment and national policy. These objectives will be achieved by setting principles and goals for electricity tariff structures aligned with the MYPD process, the Codes and the EPP.

From these objectives, design principles have been developed to further guide the development of Eskom's tariffs over the next five years. These principles will be split into the following areas: energy, Transmission charges, Distribution charges, retail, wheeling, net billing, new tariffs, and other value-added services.

5. DESIGN PRINCIPLES

These strategic objectives will guide the design principles in the determination of tariffs. The design principles will address the following aspects:

- Revenue neutrality
- Structural adjustment and the MYPD process
- Retaining sales and encouraging growth
- Energy charges
- Lifeline tariffs
- Distribution use-of-system charges
- Transmission use-of-system charges
- DUoS and TUoS charges for wheeling
- Grid-tied and net-energy billing
- Retail charges
- Alignment of rural tariffs'
- Subsidies

5.1. REVENUE NEUTRALITY

Nersa requires that the sum of all tariff charges multiplied by their volumes must equal the annual revenue requirement determined through the MYPD process. This is the golden rule

However, volume changes impact revenue neutrality, even when there are no tariff changes. With tariff changes, the volume variance and customer response are not always known. This increases the volume variance risk for either over- or under recovery. Being locked into being revenue neutral means that there is limited ability to have flexible tariffs. A regulatory mechanism, therefore, needs to be in place that allows for a sharing of risk between Eskom and the impact on the rate base, such as an allowance of x% of volume being permitted to be on more flexible pricing.

Any flexibility of tariffs must, however, have an overall benefit for the customer, Eskom, and the rate base, as far as possible. For example, if there is surplus energy, this could be offered through an auction process or a day-ahead pseudo-market at a lower price, provided it is linked to additional sales. This would have the impact of reducing the average price of electricity.

Design Principle 1: Revenue neutrality

- *Eskom will determine tariffs charges and structures on a revenue -neutral basis*
- *However Eskom shall engage to establish a regulatory mechanism that allows for flexibility to make tariff changes within a regulatory period.*

This is aligned with EPP Policy Position1 and Policy Position 14

5.2. STRUCTURAL ADJUSTMENT OF TARIFFS AND THE MYPD PROCESS

Restructuring of tariffs can happen at any time during the MYPD process. Structural changes should, as far as possible, however, be done based on a cost-of-supply study. A cost-of-supply study should only be done once an MYPD decision has been made by Nersa. This means that the cost-reflective charges are determined based on the costs of each division and that the structure of the charges is based on the cost causation.

It may be also be appropriate to do structural adjustments using existing revenue and not starting with costs, such as combining two tariff options into one.

Design Principle 2: Structural adjustment of tariffs and the MYPD process

- *A cost-of-supply study will be completed only after a Nersa approved MYPD. Structural adjustment of tariffs will be based on the updated cost-of-supply study.*
- *The cost-of-supply study will use the Nersa approved costs per Eskom licensee.*
- *The cost-reflective charges and structure shall be based on the cost-of-supply study and the cost causation.*
- *Where tariffs are combined or rationalise, existing revenue from these tariffs will form the basis of the adjustment and not cost.*

This is aligned with EPP Policy Position 9, Policy Position 12, Policy Position 17, Policy Position 19, Policy Position 23, Policy Position 35 and Policy Position 53

5.3. RETAINING SALES AND ENCOURAGING GROWTH

For any organisation, it is a priority to retain and grow sales. In the light of increasing prices and decreasing alternative sources, this will remain a challenge. Therefore, strategies and regulatory mechanisms, as discussed Design Principle 1, that give Eskom the ability to respond quickly to increase sales and to provide certainty through take-or-pay time arrangements, is vital.
`

Customers who can reduce volume volatility should be provided with tariffs that reward them for this. Volatility in volumes has the ability to negatively impact the price of electricity (as seen in the recent RCA applications). This may mean customised tariffs or tariff options for qualifying customers.

Design Principle 3: Retaining and encouraging growth in sales

- *To retain and grow sales, customers who can provide flexibility of usage or customers that can guarantee usage may be offered customised tariffs.*
- *A regulatory mechanism will have to be developed to facilitate this.*

This is aligned with EPP Policy Position 14

5.4. COST CAUSATION

Cost causation is where the cost being incurred as a direct result of providing a service, should be borne by those who cause the cost to be incurred, that is, commensurate with benefits and those that do not benefit should not be allocated costs. Cost causation and cost reflectivity are closely linked; cost causation refers to reflecting the driver of the cost, and cost reflectivity means reflecting the value of the driver of the cost.

Traditionally, tariffs for smaller customers have been simple and have not reflected the driver of the cost; that is, the cost of the network being available at all times is fixed, but is recovered through variable usage charges and/or does not reflect the value of the cost. For small customer tariffs, a large portion of fixed costs is usually recovered by variable c/kWh charges.

For example, a network is designed around diversified demand, but individual households may use more or less of that demand. Demand is typically measured as the maximum kVA used over a specified period. If the demand-related costs of providing the network are recovered through c/kWh charges and not through R/kVA demand-related charges, then the tariff charge does not reflect cost causation. This demand component deals with the maximum capacity that must be available at all times, even if only used for a few hours a year.

Therefore, customers who pay for fixed costs through variable-usage-based charges are actually also paying to ensure that the network is available all year around, and only a portion of their tariff reflects energy-only costs. Where there is a reduction in energy sales and if any portion of fixed costs is recovered through c/kWh charges, this has a direct impact on the utility's revenue.

The reduction in sales could be due to various reasons such as increasing electricity prices, competition from other sources (for example, PV), a downturn in the economy, increasing energy efficiency, carbon taxes, and reduced reliability of supply.

A sample of the current Eskom tariffs comparing cost and tariff revenue. This shows the (mis)alignment of the tariff with the cause of the cost, structurally and related to subsidies. This misalignment has been caused by historical factors and decisions outside of Eskom's control.

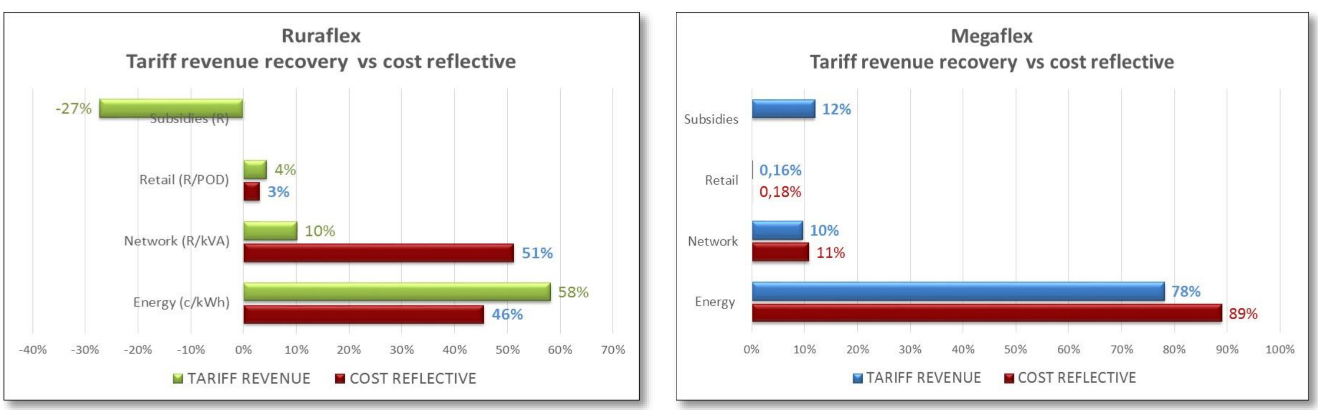

Figure 8: Comparing cost and tariff structure

It can be noted that, in 2016, none of the above tariffs recover the costs in exactly the same quantum as the tariff charge. The most cost-reflective is Megaflex, but the energy charges are lower than the costs and Megaflex is also a contributor to subsidies, so 12% of the tariff charges can be attributed to subsidies paid across to other tariffs, for example, Ruraflex.

Ruraflex receives subsidies and the tariff structure is not cost-reflective. For example, part of the network costs is recovered though a c/kWh charge, resulting in the c/kWh-related charges recovering in excess of the energy-related costs. The opposite is true for the network charges, where only a very small portion of the cost is recovered through a fixed network charge.

Design Principle 4: Tariff structures to reflect cost-causation

- *Tariff structures must move further to reflect cost i.e. fixed vs. variable; and*
- *Tariffs must as far as practicable reflect the nature of the cost and ensure those causing the cost pay the correct charges*

This is aligned with EPP Policy Position 2, Policy Position 12, Policy Position 27, Policy Position 35, Policy Position 36, Policy Position 45, and Policy Position 56

Cost causation is further dealt with below for each type of charge.

5.5. ENERGY CHARGES

5.5.1. Marginal versus average costs in energy pricing

Energy costs are an average based on the Nersa approved revenue requirement as part of the MYPD process. These costs include the Eskom generation costs plus IPP purchases and are averaged and split into different hours and different time of use periods to get a so-called "wholesale price" or WEPS as it is commonly known. The tariff energy charges are then all derived based on these wholesale average costs. Therefore in the standard tariffs there is no ability to reflect the marginal cost on any day or in any particular hour.

Marginal costs depend on the timing of consumption, and the closest to getting to a marginal costs tariff approach outside of a market is real-time pricing. Real-time pricing may be a more attractive option for customers in times of surplus capacity, but is not an attractive option in times of low reserves.

Inclining block tariffs are also considered a type of marginal costs approach, where incremental usage can trigger incrementally higher prices. However, inclining block tariffs do not reflect true marginal costs, as they are not linked to the cost of additional consumption or the time of the consumption, and they do not reflect the additional demand imposed. The tiers in inclining block tariffs are also often arbitrarily set, and there is little evidence of any customer response to inclining block tariffs. Therefore, as a marginal cost approach, they have little value.

A more appropriate approach is time-of-use pricing that provides a signal (albeit only on an hourly, daily, or seasonal average basis) that reflects a long-term marginal structure rather than the marginal costs themselves. Marginal costing can be used for more dynamic or customised pricing products, such as real-time pricing.

Design Principle 5: Marginal versus average cost approach to energy charges

- *The wholesale tariff energy (WEPS) charges structure will reflect the long-run marginal costs of energy.*
- *The WEPS rates will be based on the average cost of energy*
- *Fixed-term flexible tariff options could have short-run marginal cost signals incorporated in the energy rate*
- *Any flexible/customised pricing options may be based on short-run marginal cost signals.*
- *Eskom tariffs will all be designed based on the WEPS energy charges structure and rates.*

This is aligned with EPP Policy Position 6, Policy Position 12 and Policy Position 58

5.5.2. Fixed and variable costs in energy pricing

Generation costs comprise both fixed and variable costs, but are typically recovered through variable c/kWh charges, even though these costs can be recovered through fixed demand-related charged capacity payments for being available when dispatched and a variable fuel-based payment, or take-and-pay arrangement.

The question, therefore, is whether the energy charges should recover these costs using a fixed and variable structure – and not as currently done only using c/kWh. Moving to recovery of fixed charges would reduce the c/kWh price, and the customer would have a fixed amount payable every month for energy. For example, if the variable energy tariff is 100 c/kWh, and the mix of fixed and variable costs is 50:50, this would reduce the 100 c/kWh to 50 c/kWh, and the other 50c/kWh would be converted to a fixed amount payable each month based on the demand.

Recovery of fixed energy-related costs through fixed energy charges reduces the volume risk when sales are reduced, but it also reduces the signal to the customer to be energy efficient, as the volumetric energy price will have to be reduced. It can also incentivise people to go off-grid, as they have to pay a large amount up front before any energy is consumed.

Design Principle 6: Fixed and variable recovery of energy costs.

- *At wholesale energy level (i.e. Generation costs only) it is possible that the wholesaler will take on a fixed and variable purchase energy price, but the wholesale selling rate will be on a TOU and c/kWh basis.*
- *Retail energy costs will predominantly be recovered through c/kWh variable energy charges i.e. based on kWh and where applicable TOU.*
- *A different structure could, however, be provided for high load factor customers.*

The above is aligned to EPP Policy Position 6, Policy Position 9, Policy Position 13 and Policy Position 58

5.5.3. TOU energy prices – retail and wholesale structure

TOU tariffs have energy charge schemes that can be based on different prices and price ratios, hours, periods and seasons.

The current wholesale TOU structure (WEPS) and price ratios between charges (i.e. all other c/kWh values compared to the summer off-peak price) have been in place since 2005 and no longer reflect the current system requirements and costs in the time-of-use periods. The following figure shows the current TOU periods and ratios.

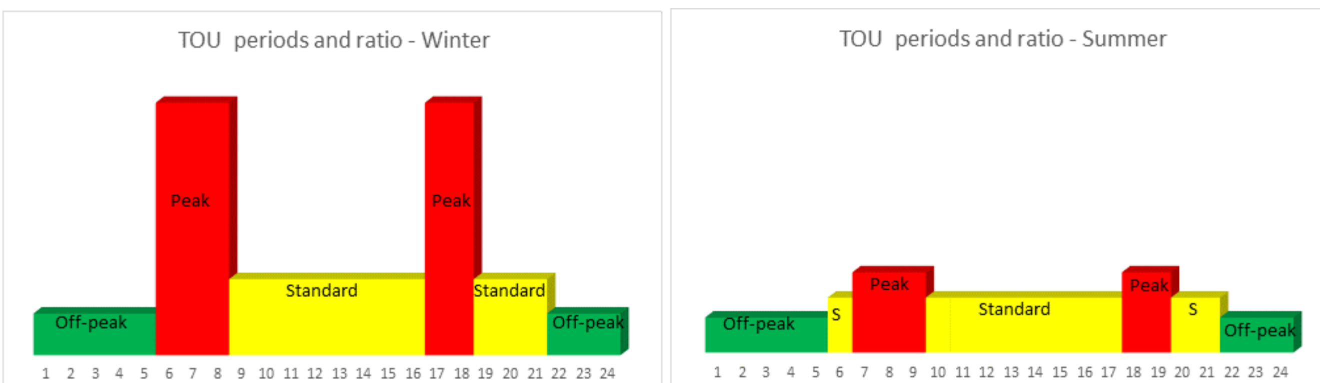

Figure 9: TOU weekday periods and price ratios

The current TOU ratios are as follows:

High			Low		
P	S	O	P	S	0
8,00	2,31	1,18	2,49	1,48	1,00

Customers who have responded to the current pricing signals have assisted Eskom in managing the peak periods, and this response has contributed to the flattening of Eskom's load profile and the management of demand, in particular, in the winter TOU periods (June to August). The changes in the Eskom system load profile over a period of 20 years (normalised) are shown in the following figures.

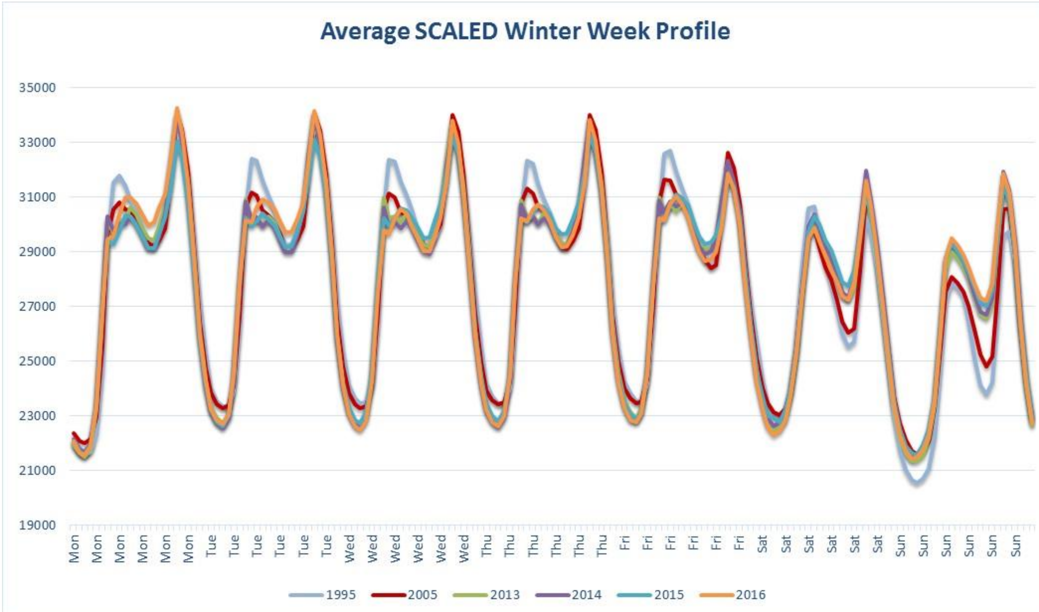

Figure 10: Load profile changes, winter average week

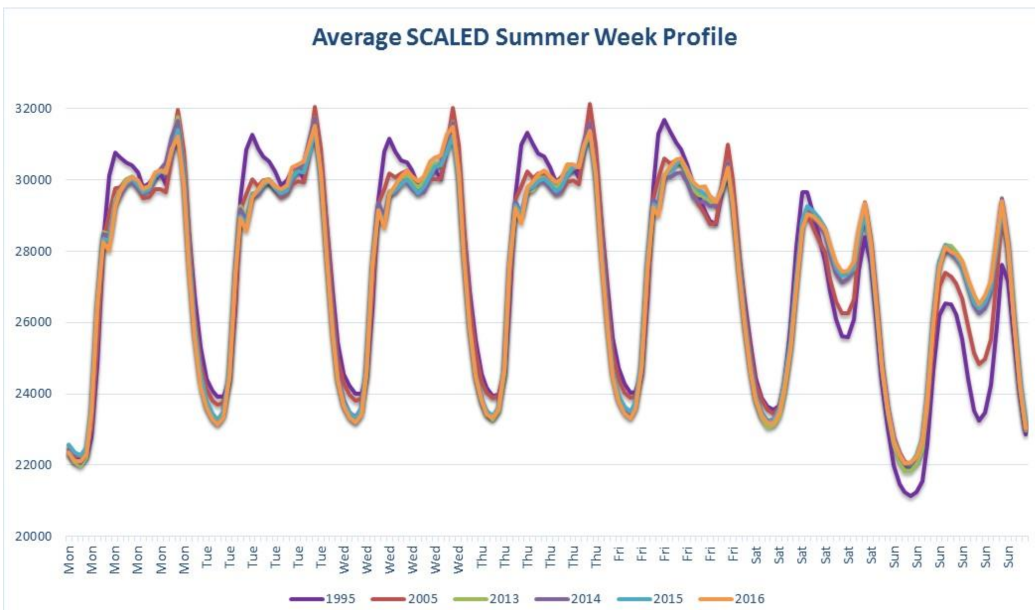

Figure 11: Load profile changes, summer average week

What is clearly noticeable is the change in the morning peak over the years, the reduction in the evening peak on Fridays and the overall increase in the Sunday profile.

The current TOU structure therefore requires updating to give more relevant pricing signals to customers. TOU changes are, however, constrained for the following reasons:

a) The customer response is not known, and this could potentially result in a revenue variance, positive and negative, which would need to be accommodated in the future-year revenue clearing account (RCA). It is, however, an opportune time to make such changes, as Eskom no longer has a shortage of capacity, and the system is, therefore, more flexible to handle unknown responses.
b) It is not possible to have perfectly cost-reflective rates in each time period, as the charges are based on an average profile and costs. This can be accommodated, however, with more dynamic pricing tariffs.

c) The decision regarding changes to the number of blocks, periods, and prices in each period and the resultant impact on customers are important, as these will have an impact on revenue and on customers' price and operations. Reducing the peak price will result in an increase, for example, in the standard and off-peak price. This may suit customers who have high peak consumption, but will not suit customers who have optimised their operations to reduce peak consumption. For the former type of customer, this would result in a reduction regarding overall price, but for the latter, this would result in an increase.
d) There is the question whether the TOU blocks, periods, and prices should be the same for all customers and whether these should include signals to incentivise customer behaviour. The signals may not be "cost-reflective", but may rather signal optimisation of system use.
e) Many customers do not have the option for TOU tariffs due to the metering capabilities. The EPP, however, requires that all customers above 1 000 kWh per month must be on TOU. With rooftop PV, it will become a necessity for customers to be on TOU metering to ensure that there are the correct tariff signals to protect revenue and cost. Eskom is in the process of rolling out smart metering, which will enable the application of TOU to small customer tariffs.

The intent for energy charges is to reflect cost causation at least in the TOU blocks and periods, guided by the requirements of the System Operator and Eskom Generation, with dispatchable plant currently playing the role of the balancing mechanism for the System Operator. Therefore, all tariffs, except the lifeline tariffs, should have energy charges that reflect the TOU. The TOU structure may differ for different customer categories and may, in addition, include signals to further optimise the load profile.

This means, for example, doing away with Nightsave as a tariff option and making all small power user tariffs' energy charges, except for the lifeline rates (Homelight 20A), TOU. For small power tariffs, this will be subject to metering capabilities, as mentioned above. There is, however, acceptance that, for certain customers, more dynamic tariffs or short-term tariffs can be offered.

In the light of the impact that PV can have on the power system, that is, exporting during standard periods and importing in peak periods, TOU energy charges are required to incentivise the use of off-peak power and reduce peak power. Off-peak charging of inverters, batteries for PV systems, and electric vehicles can also be incentivised through the use of TOU and dynamic tariffs, and these can, furthermore, be used to provide ancillary services to the utility.

The wholesale tariff TOU structure needs to be amended to reflect the current profile, but also to retain a TOU signal. Without, in particular, the large power user's response to TOU, peak consumption would naturally increase, and this would result in increased costs for Eskom and, ultimately, the customer. Therefore, the intent should be to retain a TOU signal.

The table below shows an *indicative* change in the TOU ratios and the impact this would have on a theoretical price. For example, a reduction in the winter peak price, such as that shown below (that is, "proposed ratios"), would require an increase in the peak and standard summer price. The results below also include an increase of one hour in peak in the evening and an increase of four standard hours and a reduction of four off-peak hours to adjust for the change in profile.

	Ratio	Current price	Ratio	New price
High				
P	8,00	283,52	7,00	201,18
S	2,31	81,87	2,60	74,72
O	1,18	41,82	1,00	28,74
Low				
P	2,49	88,25	4,00	114,96
S	1,48	52,45	2,31	66,39
O	1,00	35,44	1,00	28,74

The actual changes in ratios will be included in an upcoming tariff restructuring plan. The design principles to be applied are as follows:

Design Principle 7: TOU recovery of energy costs.

- *There will be a revision of the TOU structure to more accurately reflect the periods, seasons, days and charges.*
- *The TOU ratios between winter and summer will be reduced i.e. reducing the winter tariffs and increasing summer rates.*
- *Eskom will move away from all non TOU based tariffs, except for the single-phase supply tariffs, and short-term and dynamic tariff offerings that may have a different TOU structure or even a non-TOU structure for high load factor customers.*
- *Energy charges will be based on the WEPS energy charge structure aligned with Design Principle 5: Marginal versus average cost approach to energy charges. The TOU rates may be adjusted for specific identified customer segments to accommodate dynamic tariffs for specific tariff offerings; refer to Design Principle 8: Short-term and dynamic recovery of* energy costs.
- *Notwithstanding bullet above, different TOU schemes may be applied to different tariffs.*
- *TOU energy tariffs for will be mandatory for all customers with grid-tied generation (refer to paragraph 5.10), irrespective of phase of supply and will have a fixed charge to cover the cost of the network.*
- *Inclining block tariffs will only be made available to single-phase supplies. Refer further to Design Principle 10: Lifeline tariffs*
- *Eskom will offer dynamic tariffs to small power customers, subject to metering capabilities.*

The above is aligned to EPP, Policy Position 12, Policy Position 13, Policy Position 31, Policy Position 32, Policy Position 36, Policy Position 48 and Policy Position 58. (Note, however, that these policy positions do not accommodate inclining block tariffs

5.5.4. Short-term and dynamic energy prices

Pricing products could be offered to customers to further promote the efficient use of energy and to provide options to the System Operator for optimal dispatch of plants and use of ancillary services. These products would typically reflect a response to a shorter-term demand and supply imbalance. Even though there is no longer a shortage of capacity, there are days or hours that these type of tariffs can be used to provide a more economic and efficient power system. This could mean lower prices at times of excess capacity and higher prices when the system is constrained.

In various pilot projects around the world on demand response programmes, it was found that pricing products, especially when combined with enabling technologies, could produce much larger reductions in peak demand than traditional TOU or non-technology-enabled critical peak pricing rates[7].

Design Principle 8: Short-term and dynamic recovery of energy costs.

- *Eskom shall develop energy charges that provide dynamic pricing signals.*
- *Take-or-pay for a percentage of sales and the remainder on a real-time, day-ahead or week-ahead, or rebated basis; this would also include rebates for network/system unavailability; take-or-pay would require a market mechanism to be developed (above a certain size and that can respond)*
- *Hour-ahead, day-ahead, week-ahead options*
- *Flexible TOU tariffs – days, periods, and seasons variability*
- *Use of critical peak day pricing or peak time reduction rebates*
- *Interruptible rates*
- *Off-peak rebates on additional sales.*

The above is aligned with EPP Policy Position 6, Policy Position 58 and Policy Position 59

[7] (Source: *Primer on Demand-Side Management*, produced for the World Bank by Charles River Associates.)

5.5.5. Other energy-related products

Other energy-related products could include green energy tariffs.

Design Principle 9: Energy products

- *Introduce a green tariff/surcharge for customers who want to buy green energy. This tariff would be based on the Eskom costs for purchasing renewable power.*

The above is aligned with EPP Policy Position 11 (c).

Green energy tariffs would require Eskom to receive accreditation for the "greenness" of the energy, and Eskom would also need to be mindful of competition issues, as it would be competing with other potential green energy suppliers. The rate at which the green energy would be charged should compensate Eskom for any loss associated with a carbon tax rebate.

5.6. LIFE LINE TARIFFS

The lifeline tariffs are meant to provide a basic electricity service at a subsidised rate, but should be targeted at the indigent, that is, those who cannot afford to pay the full tariff. The current inclining block tariffs are provided to all residential customers and, therefore, provide a subsidy to all low-consumption residential customers. Eskom's lifeline tariffs are Homelight 20A and Homelight 60A.

Design Principle 10: Lifeline tariffs

- *Inclining block tariffs will only be used for single-phase supplies and to provide subsidies for low-consumption supplies in the low energy block (that is, lifeline tariff rates).*
- *Inclining block rates will include network and retail costs for the second block, and these may also be subsidised, depending on Nersa decisions.*

The above is aligned with EPP Policy Position 36, Policy Position 48, Policy Position 49 and Policy Position 50. Note these policy positions do not accommodate inclining block tariffs or subsidies for 60A supplies. However, based on a Nersa decision, inclining block tariffs are assumed to provide the protection for the poor envisaged in the EPP.

5.7. DISTRIBUTION USE-OF-SYSTEM (DUoS) CHARGES

The Distribution network costs are the costs of the Distribution business associated with capital (regulated return on assets and depreciation) for new and refurbishing of existing infrastructure, maintenance and operations. The Distribution use-of-system charges (DUoS charges) are unbundled retail charges that reflect these Distribution costs, plus any contribution to network-related subsidies and are as follows:

- Network charges – split into fixed and variable components
- Ancillary service – pass-through cost from the System Operator in Transmission
- Embedded Transmission network charges – pass-through cost from Transmission
- Administration and service charges related to the provision of a network service
- Subsidy charges – the electrification and rural subsidy charge and the low-voltage subsidy charge.

DUoS charges are indicative of the Distribution network costs at a particular point in time, but they are not cost-reflective over time until they have been updated with a cost-of-supply study, as in between the cost-of-supply study being updated, the average price increase is applied.

The network business is just as important as the generation of electricity because network assets; wires, poles and transformers are needed to transport the energy from the generator to the consumer and to accommodate bi-directional flow of energy where the customer is both a consumer (load) and a generator.

Design Principle 11: DUoS charges

- *DUoS charges shall be the basis for all network-related charges and shall be based on cost causation related to capacity used, the voltage, Transmission zone, losses and whether a supply is classified as urban or rural (as defined by NRS 069) based on an updated cost-of-supply study.*
- *DUoS charges for loads shall recover ETUoS charges, the cost of managing and operating the Distribution network, Distribution losses, ancillary services, retail costs and the NERSA approved contribution to subsidies for all users of the Distribution network, both local and international.*
- *DUoS charges for generators shall recover the cost of managing and operating the Distribution network, Distribution losses, ancillary services and retail costs.*
- *A contribution to network subsidies shall not be paid by generators.*

The above is aligned with EPP Policy Position 17, Policy Position 27, Policy Position 33 and Policy Position 35

Marginal costs for Distribution tend to be much more smoothed than for instance the marginal cost of generation and do not differ significantly from average costs, except for connection costs. The raising of a connection charge ensures that the customer causing the incremental investment contributes directly to the investment and not the general rate base. Therefore, investments that benefit the rate-base should be recovered through use-of-system charges and investments that benefit an individual customer should be recovered through a connection charge.

Design Principle 12: Marginal versus average cost approach to Distribution charges

- *Customers will be required to pay the marginal cost of connection through connection charges and the average cost of managing the Distribution network through tariff charges.*

The above is aligned with EPP Policy Position 21 and Policy Position 36

5.7.1. DUoS network charges

The DUoS network charges are categorised according to justifiable common shared characteristics such as:

- the voltage of the supply; and
- the location of the supply.

The voltage of the supply, the Transmission Zone and whether a supply is classified as urban or rural is used to segment Distribution costs. Networks are pooled into voltage categories in order to determine the average cost per voltage category. No change is proposed to the existing voltage categories. They remain as follows:

Table 1 – Voltage categories

EHV (Extra high voltage)	>132 kV or direct Transmission connected
HV (High voltage)	≥ 66 and ≤ 132 kV
MV (Medium voltage)	> 500 and < 66 kV
LV (Low voltage)	≤ 500 V

The Distribution network charges will differ on the basis of the differences in cost between urban and rural networks. The cost of providing supply in an urban area and in a rural area differs significantly, owing to differences in the average cost per connection, the cost of service and administration and losses. Even though rural tariffs have higher charges, these tariffs do not recover the cost of providing supply i.e. there are currently inter-tariff cross-subsidies from urban tariffs to rural tariffs.

In order to be more cost-reflective in level, tariffs in rural and urban areas would need to be different. For rural supplies, a significant portion of the capital cost is recovered through subsidies and in the tariff, making connections more affordable. If the urban and rural tariffs were to be combined, the overall effect would be that the urban tariffs would increase, the rural tariffs would decrease and the subsidies paid by the urban tariffs and received by the rural tariffs would be hidden. Based on the current level of cross-subsidies, there is no economic justification for combining the rural and urban tariffs.

Design Principle 13: DUoS network charges for loads and generators

- *The current voltage categories and rural/urban differentiation will not be changed.*
- *As more information is obtained related to the impact of embedded generators, network charges may become more localised and more accurately determined. DUoS charges for generators for both urban and rural shall be revised to become more cost-reflective. This may result in DUoS network charges being raised for MV and LV -connected generation.*
- *DUoS shall be raised for both generators and loads according to a fair contribution formula based on R/kVA and whether fixed or variable. (Refer to Design Principle 17: Fixed versus variable Distribution DUoS charges.)*
- *Network-related subsidies will be provided as approved by Nersa. (Design Principle 24: Contribution to network-related subsidies.)*
- *DUoS charges will be unbundled for all ≥ MV connected loads and generators.*
- *For LV-connected loads and generators, DUoS charges may be bundled or unbundled, depending on the tariff.*

The above is aligned with EPP Policy Position 27

5.7.2. DUoS losses charges

The DUoS losses charges are categorised according to justifiable common shared characteristics such as:

- the voltage of the supply; and
- the location of the supply (rural/urban)

Losses will vary according to the voltage of the supply and the distance the supply is from the source. Losses on the transmission system as well as distribution system losses must be recovered through the tariff.

Loss factors will be applied on energy to recover the cost of losses. The loss factors to determine transmission losses will be set by Eskom Transmission based on the Transmission zones. For Distribution networks, the loss factor will differ and will be applied per voltage and rural and urban category based on an updated cost-of-supply study.

Design Principle 14: DUoS losses charges for loads and generators

- *Loads shall pay for losses according to the voltage of the supply and the Transmission zone.*
- *Loss factors will be based on a cost-of-supply study using the approved voltage categories*
- *Generators shall pay or be compensated for losses according to the voltage of the supply and the Transmission zone.*
- *As more information is obtained related to the impact of embedded generators losses charges/compensation may become more localised and more accurately determined.*

The above is aligned with EPP Policy Position 27

5.7.3. Reactive energy charge

The reactive energy charge is a signal to customer to manage their power factor within certain limits. Currently the only tariffs that have a reactive energy charge are the TOU tariffs and this charge is payable by loads in winter only. This means that customers do not receive a reactive energy signal for poor power factor in the low-demand season. The intent is to provide this signal in all time periods and in all seasons.

Design Principle 15: Reactive energy charge

- *The reactive energy signal shall be strengthened and will be applied during all months of the year.*

The above is aligned with EPP Policy Position 27

5.7.4. Impact of embedded generation on DUOS charges

Based on research done on the potential impact of embedded generation on distribution networks[8], the following conclusions can be drawn:

- Losses on radial distribution networks exhibit "bathtub curve" type behaviour.
- Reversing power flows due to embedded generators leads to increased losses.
- Larger reductions in losses on feeders occur with smaller generators more-widely dispersed.
- Generation further away from the source of the feeder has a larger impact on losses

The following conclusions are highlighted for investment deferral:

- Using a higher number of embedded generation units to generate required installed capacity allows a larger investment deferral i.e. a larger number of dispersed small units results in greater investment deferral
- The highest impact for deferring investment is photovoltaic plants. This is mainly due to photovoltaic production matching the load profile pattern quite well.
- Embedded generation operating at unity or leading power factor provides a higher deferral benefit than that operating at a lagging power factor.
- Greatest deferral benefits were found when embedded generation was installed at the end of long feeders and near loads.
- The key factors in assessing the value of deferral are, firstly, the time delay of investment and, secondly, the time value of money.
- The value of embedded generation units to generate required installed capacity allows a larger investment deferral; that is, a larger number of units for reducing long-term investment costs is dominated by avoided transformer installation costs.

Eskom Distribution's exposure to embedded generation sources will increase significantly over the next 10 years. This has implications for both the planning of the network and the manner in which these new connections are managed by Distribution. Embedded generators decrease losses until a penetration of 50% is reached on a feeder; then losses are increased. Eskom is doing further research on the impact on embedded generation on Distribution networks, which will feed into future tariff design.

Eskom currently only raises network charges for EHV- and HV-connected generators based on the initial tariff design, where it was assumed that all MV and LV connected would reduce network costs and losses. However, it is recognised that the more generation there is on MV and LV networks, the more this can increase costs. This is particularly true for rural networks, where one generator alone may at times produce more than the total load on the local feeder, potentially causing upstream investment. Therefore, the current tariff design and structure for MV- and LV-connected generators must evolve to ensure that the customers causing the cost are appropriately charged.

Design Principle 16: Development of DUoS charges for embedded generators

- *As more information is obtained related to the impact of embedded generators, network and losses charges/compensation may become more localised and more accurately determined, including charges for MV and LV-connected generation.*
- *Where the location of a generator avoids Distribution network investment, the DUoS charges may be rebated based on the time the investment is avoided.*

The above is aligned with EPP Policy Position 9

5.7.5. Fixed versus variable Distribution network charges

The Distribution business costs are largely fixed in order to deliver the capacity needed. If network charges are not cost-reflective and are recovered through variable charges such as c/kWh, this places the Distribution business at risk of not recovering costs when volume is reduced. This could be as a result of economic conditions, increasing

---

[8] Ulrich Minnaar, Interconnection Procedures and Regulation of Embedded Generation, Eskom Research and Innovation Department, Technology Strategy and Planning.

usage of distributed generation, batteries, demand-side management, and the general improvement in smarter and more energy-efficient appliances.

The reliance on the grid is not necessarily reduced, unless the customer goes totally off-grid, but charges for having the grid as a back-up (availability at any time) or, in the case of net metering, using the grid as a bank are still required. The introduction of PV, in particular, could result in the customer being a zero net or very low net consumer; and therefore, where network costs are recovered through variable charges, this results in a loss of revenue not commensurate with a reduction in costs. It also results in customers with PV being subsidised by customers without PV. This adds to the potential of a utility death spiral if there is not a fair recovery of the grid costs through variable charges. This means, in particular for small power users, a review of tariff structures to ensure adequate recovery of fixed costs.

If network charges are designed to be a fixed charge, this reduces the revenue risk, but also reduces the signal to manage consumption and to manage this consumption in peak times. This may result in inefficient use of the network and the Distribution business having to invest uneconomically. For this reason, network charges should recover an appropriate balance between fixed and variable charges and ensure that there is an appropriate signal for peak demand and consumption.

The following figure shows the balance between customer risk and utility risk, depending on the tariff structure choice.

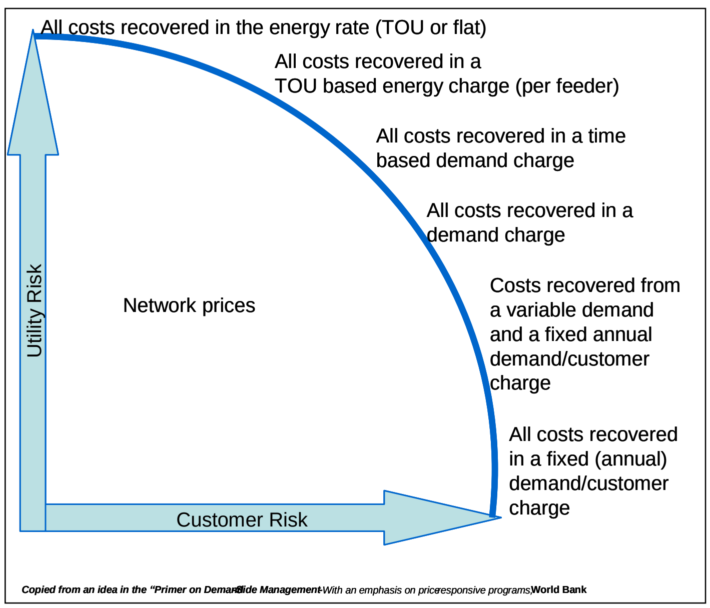

Figure 12- Network tariff structure choice

The figure above shows the options available that must be considered when designing a network charge. If all fixed costs are recovered through, for instance, an annual lump sum fixed charge, there is little utility risk, and if all costs are recovered through total variable charges, there is very little customer risk. Fixed charges are, however, not popular with low-consumption customers, as these fix the amount payable each month and also reduce customers' benefit when consumption is reduced. However, this results in an under recovery of revenue and subsidisation by customers who do have fixed charges.

Internationally, there is recognition that network tariffs need to be reformed to move away from variable-usage-based charges to tariff structures that better reflect the fixed costs and also the demand a customer imposes on the network.
This is an appropriate mechanism for coping with reduced sales due to rooftop PV to ensure that customers with PV are not overly compensated and do not burden other customers with higher price increases, as the cost of managing the grid must come from someone. Refer further to paragraph 5.10, which deals with net-billing tariffs.

Design Principle 17: Fixed versus variable Distribution DUoS charges

- *Unbundled DUoS charges will comprise a fixed network capacity charge based on NMD or MEC for loads and generators and a variable network demand charge based on monthly maximum demand or consumption for loads.*
- *The fixed portion of the unbundled DUoS charge shall at least recover 50% of the total Distribution network-related costs.*
- *The variable network charge may include a TOU signal (c/kWh or R/kVA).*
- *Small power user tariffs will be reviewed to ensure adequate recovery of fixed costs, except for the lifeline tariff.*
- *Network charges for all three-phase supplies will be unbundled from the small power user tariff's energy rates, and an appropriate fixed charge will be applicable relative to the market, including demand-related charges. The increases to ensure cost reflectivity of the fixed charges will be phased in over time.*

The above is aligned with Policy Position 27

5.8. TRANSMISSION USE-OF-SYSTEM NETWORK CHARGES

Eskom sets the Transmission use-of-system (TUoS) tariffs as specified in the Transmission Tariff Code. The TUoS tariffs reflect the use customers make of the network and the impact they have on it. These tariffs are intended to provide locational signals to customers about the transmission cost of connecting in different parts of the country and recover the Nersa-approved revenue requirement.

Eskom recovers the TUoS charges by a weighting of 50% to generators and 50% to demand customers. Transmission-connected generators and loads pay a charge based on the geographical zone in which they are. The pricing zones for generators are determined through power-flow studies, taking into account the generators' usage of Transmission assets and their geographical location. The TUoS charges for demand are differentiated into four zones based on the distance of the load, in kilometres, from Johannesburg.

There is a general industry requirement in that, as far as possible, pricing should reflect the underlying cost of supply. In other words, the various TUoS charge structures and levels should reasonably reflect the costs and cost drivers. Network charges for generators are based on a cost-reflective methodology. However, with the introduction of the renewable generators, a review of the methodology is required. Charges for loads are based on an unempirical methodology and, thus, are not cost-reflective.

5.8.1. Generator TUoS charges

TUoS tariffs for generators are derived from load-flow simulations on the Transmission system as it is planned to be in operation. Generation units are dispatched in proportion to their installed capacity to match peak demand. The cost of the Transmission asset is allocated to generators based on the proportional installed capacity and contributions to power flows for the different Transmission assets. The current charging methodology only recognises peak security as a driver of Transmission charging.

The integration of renewable generation brings fundamental challenges in Transmission planning and charging. The current Transmission pricing methodology does not appropriately reflect the costs imposed by different types of generators (in particular, renewable generators) on the electricity Transmission network. The charging methodology only recognises peak security as a driver of network usage and assumes that all types of generation within an area of the network (a generation charging zone) contribute equally to network use. In doing so, it overlooks the fact that some generators use the Transmission system more during the peak hours and some less. Under the current methodology, all types of generators are assumed to provide peak security...

5.8.2. Load TUoS charges

The TUoS tariffs for loads are based on a concentric-pricing approach. The charge is geographically differentiated in four zones based on the distance of the location of the load from Johannesburg, measured in kilometres. This differentiation methodology is arbitrary and results in non cost-reflective charges.

It is generally argued in the industry that the different approaches for determining charges for generators and loads create artificial arbitrage opportunities and economic discrepancies that are difficult to explain. It is recommended that the approaches be harmonised in the medium to longer term.

Against this background, Eskom proposes to review the approach for determining network and losses charges for generators and loads in the following manner:

Design Principle 18: TUoS charges for generators and loads

- *TUoS charges are to be based on a cost-of-supply study and are to be allocated on a 50/50 basis to loads and generators.*
- *TUoS charges are to be comprised of a fixed network charge based on NMD or MEC, an ancillary service charge based on c/kWh, and a losses charge based on Transmission loss factors.*
- *These tariffs are intended to provide locational signals to customers about the Transmission cost of connecting in different parts of the country and recover the Nersa-approved revenue requirement.*
- *The TUoS charges for loads and generators will differ and will be based on pricing zones.*
- *Review the generator charging zones, taking into account the impact of additional generation connections and Transmission investment plans.*
- *Review the cost-of-supply methodology for generators to appropriately reflect the costs imposed by conventional and renewable generation technologies.*
- *TUoS charges for loads are to be based on a load-flow methodology that allocates the costs into the current four concentric zones. Review the percentage distribution of the concentric load zones.*
- *The ancillary service charge is to remain variable (c/kWh).*
- *International customers are to pay the approved TUoS charges for assets used in South Africa.*
- *TUoS charges are to be allocated to loads connected within the Distribution network as ETUoS charges. ETUoS charges, except for the ancillary service charge, will not be allocated to Distribution-connected generators within the Distribution network.*
- *Transmission- and Distribution-connected generators may be allocated a transformation capacity connection charge if Transmission assets are needed to evacuate power through the Transmission network.*
- *For Eskom's large power users' tariffs, the underlying Transmission TUoS structure is to be reflected in retail tariffs as ETUoS charges. For the small power users' tariffs, this cost is to be averaged in the network charge.*

The above is aligned with EPP Policy Position 17, Policy Position 19 and Policy Position 20

5.9. DUOS AND TUOS CHARGES FOR WHEELING

In compliance with the Electricity Regulation Act and the Eskom transmission and distribution licences, Eskom must provide non-discriminatory access to the grid. Therefore, access and the DUoS and TUOS charges for the delivery of energy are, therefore, independent of the supplier of the energy or the buyer of the energy. Where energy is wheeled through a bilateral arrangement/contract, the charges for the delivery of the energy will be the same charges as for customers buying their energy from Eskom.

Eskom, however, does not make the decision as to whether wheeling and bilateral trade are permitted. This is done through the Nersa licensing process, DoE ministerial determinations, and in compliance with the ERA.

Design Principle 19: DUoS and TUoS charges for wheeling of energy

- *A generator wheeling energy will pay the standard generator DUoS or TUoS charges as applicable.*
- *A load buying wheeled energy will pay the standard loads DUoS and TUoS charges as applicable.*
- *No customer who is wheeling will be subsidised by a non-wheeling customer.*
- *A wheeling customer will have to pay the administration costs involved in a wheeling transaction.*

The above is aligned with EPP Policy Position 5

5.10. GRID TIED AND NET-ENERGY BILLING TARIFFS

Net billing is a credit mechanism where the customer's generation is synchronised with the grid (grid tied), and at times, there may be export of energy. This energy is not purchased by the utility; the energy still belongs to the customer. Depending on legislation, this customer may or may not be required to apply for a licence.
Customers may consider going off-grid when they get their own generation. However, there are benefits to being grid tied, and these are as follows:

- The grid is a virtual battery, that is, it can temporarily store excess energy and can accommodate more storage than a battery.
- The grid has higher efficiency rates than batteries; that is, batteries have higher losses.
- The customer can benefit from a net-billing tariff, which is a debit and credit process for energy consumed and produced at the same point of supply and not a netting of import consumption kWh and export production kWh.
- If net billing is combined with storage, the customer can benefit by reducing higher-cost peak power. Storage could include hot water and batteries (including electric cars).
- The grid provides ancillary services that the customer would otherwise have to provide such as supplemental and back-up power and a fault level.
- The customer can also provide ancillary services to the grid provider and the System Operator, that is, remote control over the generation and/or storage, for which he/she can be compensated.

With grid-tied and net-billing tariffs, it is important that appropriate charges are raised for the use of the network and the services being provided and that these charges are not raised as volumetric c/kWh charges as far as possible.

As previously stated, if tariffs do not reflect cost causation, this means that customers with own generation could end up being subsidised by customers without by reducing their contribution to covering network and retail costs, while shifting those costs onto utility customers who do not have own generation.

TOU tariffs (or dynamic tariffs) should be mandatory to ensure fair payment and compensation in the various time-of-use periods. Tariffs that reflect costs in different time periods, plus net billing, will encourage storage and the reduction of evening peaks, assisting with managing the duck curve.

Design Principle 20: Net-billing tariffs

- *Net-billing will be allowed, subject to any licensing or registration required by law and in compliance with Nersa rules.*
- *The net-billing customer will be required to be at least on a time-of-use tariff and, where applicable, dynamic tariffs.*
- *The net-billing customer will be required to pay the relevant DUoS and TUoS charges for the use of the grid associated with consumption.*
- *The net-billing customer will be required to pay the relevant DUoS or TUoS charges for the use of the grid associated with export of energy. This charge may be c/kWh, R/day, or R/kVA, depending on the tariff category.*
- *A credit rate for energy exported will be given based on avoided energy cost; see Design Principle 21: Avoided energy costs.*
- *DUoS, TUoS, and retail charges will always be payable and will not be credited against the value of energy exported.*
- *This compensation will be done on a time-of-use basis for the value of the energy exported and over the period of a year; the compensation will be capped to be no higher than energy consumed over 12 months.*
- *An additional retail charge will be raised to cover the additional cost associated with the additional billing transaction.*
- *There may be charges and/or compensation for the ancillary service provided.*

There is no EPP policy position addressing net-billing

The net-billing customer will be required to pay the relevant DUoS or TUoS charge for the use of the grid. At the time of writing, the above is aligned with the Nersa draft rules for small-scale embedded generation, which are awaiting the finalisation and promulgation of the ERA licensing regulations and exemptions. The avoided energy cost on which the credit rate will be based will be determined as follows:

Design Principle 21: Avoided energy costs

- *The net-billing customer will receive compensation for the energy exported onto the grid and used by Eskom to at least the avoided energy cost to Eskom and never higher than the average energy cost for the relevant tariff.*
- *The avoided energy cost will reflect the value to Eskom of the energy exported. No subsidies will be provided to the customer through the net-billing tariff.*

There is no EPP policy position addressing the calculation of avoided energy cost

5.11. RETAIL CHARGES

Retail charges recover the cost of administration (meter reading, billing) and customer service queries, applications, quotation, call centres, etc. The current service and administration charges are not cost-reflective and not aligned across the tariffs and need to be updated after again looking at the customer segmentation categories.

Customer service charges are currently raised per account and not per point of delivery (POD), but a customer could have many PODs under one account and pay the same service charge as a customer who has one account and one POD.

Design Principle 22: Retail charges

- *Retail charges shall recover cost of meters, meter reading, billing and customer services*
- *Retail charges shall be based on appropriate segmentation linked to the level of administration required and the level of service provided to the customer.*
- *The service and administration charges will be aligned across tariffs between rural and urban and between municipal and non-municipal tariffs*
- *Except for Eskom's lifeline tariffs all tariffs will pay cost-reflective R/day retail charges. Refer to paragraph 5.6.*
- *Retail charges will be split into an administrative charge and a customer service charge for large power user tariffs and will be combined for small power user tariffs based on the segmentation.*
- *Administration charges shall be charged per POD and service charge shall be graduated from charges per Account to charges per POD and on any additional transactions such as wheeling or net-billing transaction.*
- *For any transaction required on the bill an additional administration charge will be raised.*
- *Additional retail charges may be applicable for value-added services.*

The above is aligned with EPP Policy Position 27

5.12. ALIGNMENT OF RURAL TARIFFS

Eskom has three rural tariffs: Ruraflex, Nightsave Rural, and Landrate. These three tariffs are not aligned due to historical changes over the years. Ruraflex, in particular, is much cheaper than Landrate and Nightsave and is the most subsidised of the rural tariffs.

The intent is to align these tariffs and to also increase Ruraflex to reduce the subsidies. Furthermore, as mentioned previously, consideration will be given to removing Nightsave Rural as a tariff option.

Design Principle 23: Alignment of rural tariffs

- *Ruraflex tariff level shall be increased so that the level of subsidies (as a %) shall not be greater than Landrate*
- *Nightsave Rural tariff shall be phased out.*

The above is aligned with EPP Policy Position 31 and Policy Position 53

5.13. SUBSIDIES

5.13.1. Network-related subsidies

In order to ensure that all Eskom electricity consumers in South Africa make a fair contribution to the network-related subsidies, that is, the electrification and rural subsidies and low-voltage subsidies applicable to the LV and MV large power user tariffs, customers connected directly to Distribution and Transmission will be charged the electrification and rural subsidy charge and the low-voltage subsidy charge.

These subsidies will be determined by Eskom, but subject to change, based on Nersa approval, to all affected tariffs. The subsidies will be split into network-related subsidies and energy-related subsidies.

Design Principle 24: Contribution to network-related subsidies

- *The contribution to network-related subsidies will be based on the difference between the cost of supply and the tariff revenue, less the energy-related subsidies, per tariff category.*
- *Lifeline tariffs and rural tariffs will continue to receive a subsidy, unless indicated otherwise by Nersa.*

- *Urban large power user customers connected to both Distribution and Transmission will be charged the electrification and rural subsidy charge and the low-voltage subsidy charge contained in the DUoS charge.*
- *Eskom will reduce the urban low-voltage subsidy charge paid by HV- and EHV-connected customers to zero over a period of time, and such reduction will be subject to Nersa approving increases to the affected customer on MV and LV large power user tariffs where the subsidy is paid.*
- *Small power user customers will not be required to contribute to the electrification and rural subsidy, and all urban three-phase supplies shall not receive subsidies per tariff category, except for Nersa-approved rural tariff subsidies.*
- *Eskom will seek alternative funding for the above subsidies through the fiscus.*

The above is aligned with EPP Policy Position 44, Policy Position 45, Policy Position 50 and Policy Position 53

5.13.2. Energy-related subsidies

Nersa may determine additional subsidies related to protecting low-consumption residential customers against high price increases. The value is determined by Nersa and not Eskom.

Design Principle 25: Contribution to energy-related subsidies

- *The energy-related subsidies will be determined by NERSA and shall be given to the lifeline tariffs only.*
- *The payment of these subsidies will be applied to the large power user urban non-municipal tariffs only, or as determined by Nersa.*
- *Eskom will seek alternative funding for the above subsidies through the fiscus.*

The above is aligned with EPP Policy Position 44 and Policy Position 45

6 CONCLUSION

Eskom believes that the objectives are aligned with the EPP, the ERA, and the codes and will send out the correct pricing signals for a viable electricity industry, providing a sound and justifiable foundation for electricity tariffs. These principles should be adopted, irrespective of the structure of the electricity supply industry, to ensure fair and equitable treatment of all electricity consumers in South Africa.

Eskom accepts that, if changes are implemented, the rate of change will depend on Nersa approvals, technology, system requirements, and the impact that the structural changes will have on customers' bills.

6. ACCEPTANCE

Name	Date	Designation
GCS Pricing Committee		
RPE Committee		

7. REVISIONS

Date	Compiler
1999	Johan Crous
2007	Shirley Salvoldi
2017	Shirley Salvoldi

8. DEVELOPMENT TEAM

The following personnel were consulted in the drafting of this document:

Vashna Singh, Deon Conradie, Terry Njuguna, Charles Mahony, Kevin von Berg, Sanjay Bhana, Mutenda Tshipala, Leshoto Thooe, Lolo Buys, Gift Huma, Choshane Phaahla, Robert Smith, Sam Mashile, Lloyd Jones, Sashika Ramkison, Trevor Myburgh, Zuhdi Hamza, Kumi Chetty, Algie Kiewitz, Keith Bowen, David Fourie, Ken Hales, Thys Moller, Hasha Tlhotlhalemaje, Callie Fabricius, Michael Barry, Teresa Smit, Barry MacColl, Hitesh Umley, Dharmesh Bhana, Wiets Botes, Dirk Opperman, Hannes Bekker, Cishimpi Mabasa, Sindiswa Rubushe, Thulani Sibisi, Lodine Redelinghuys, Rob Stephen, Calib Cassim, Jan Engelbrecht, Coert Groenewald, Kubeshnie Bhugwandin, Ulrich Minnaar, Lisinda du Plessis, and Jenny Baartman, Kurt Dedekind, Godfrey Quickfall.

9. DEFINITIONS

Also refer to Eskom's schedule of standard tariffs for further definitions at www.eskom.co.za/tariffs.

Embedded generation	Means a generator connecting to the Distribution network.
Large power user	Means a customer above 25 kVA and on the following tariffs: Miniflex, Megaflex, Nightsave Urban Large and Small, Transflex, Ruraflex, Homepower Bulk, and Nightsave Rural.
Lifeline tariff	Means the Eskom Homelight 20A tariff.
Net billing	Means a credit mechanism where the customer's generation is synchronised with the grid (grid tied), and at times, there may be export of energy.
Small power user	Means a customer with a supply size of 100 kVA or less and not on any of the large power user tariffs.

10. ABBREVIATIONS

DUoS	Distribution use-of-system charges
EHV	Extra-high voltage (> 132 kV)
EPP	Electricity Pricing Policy
ERA	Electricity Regulation Act
HV	High voltage
LV	Low voltage
Nersa	National Energy Regulator of South Africa
POD	Point of delivery
PV	Photovoltaic
TOU	Time of use
TUoS	Transmission use-of-system charges

Appendix A – National policy and framework

1 THE DOE ELECTRICITY PRICING POLICY

The Department of Energy's (DoE) policy positions are contained Appendix B – EPP Policy Positions and will be referenced throughout this document to prove alignment and compliance of the proposed strategic direction and tariff design objectives with those of the EPP. The tariff objectives contained in Table 1P in the EPP area as follows:

"Stakeholder	***Tariff Objectives***	***Description***
Customer	*Affordable*	*Price levels should assume an efficient and prudent utility, in other words prices should be based on least cost options and exclude inefficiencies.*
	Non-discriminatory	*Tariffs should be equitable and fair.*
	Predictable and Stable	*Prevent price shocks and keep customers informed about future price trends.*
	Transparent and Unbundled	*Full disclosure of cost (no hidden charges). Cost should be unbundled. Tariffs should be easy to understand and apply.*
Utility	*Revenue recovery*	*Revenue from tariffs should reflect the full cost (including a reasonable risk adjusted margin or return) to supply electricity and ensure that the industry is economically viable, stable and fundable in the short, medium and long term.*
	Efficient use	*Tariffs should promote overall demand and supply side economic efficiency, and be structured to encourage sustainable, efficient and effective usage of electricity.*
	Cost reflective	*A link between the price a user must pay to the cost of serving that user.*
	Low cost of Implementation	*Implementation and transaction costs should be minimized.*
State	*Social support*	*Tariff levels and structures should accommodate social programs.*
	Environmentally Responsible	*The production and transport of electricity should be done in a sustainable way and be mindful of the impact on the environment.*
	Sufficiency in generation capacity	*Expansion through development of least cost option resources in line with national resource planning.*
	State subsidies	*Industry needs to achieve and maintain financial sustainability without ongoing state subsidies. This does not preclude provision for targeted subsidies such as FBE.*
	Returns	*Fair and equitable."*

The specific policy positions in the EPP, will be linked where possible to the strategic principles – these are contained in Appendix A – EPP policy positions.

2 DISTRIBUTION TARIFF GRID CODE

Nersa provides guidance through guidelines, rules and codes. The Distribution Tariff Code provides the following tariff objectives (Section 3).

- *"Meeting customer requirements.*
- *Tariffs and connection charges should provide the means to recover the regulated revenue requirement in the most cost effective way so that the business is financially viable and customers can receive an acceptable level of service.*
- *Tariffs should promote overall demand and supply side economic efficiency, and be structured to encourage sustainable, efficient and effective usage of electricity.*

- *Tariffs should reflect the cost of customers' current capacity and usage.*
- *Tariffs should be non-discriminatory and transparent subject to the specific tariff qualification criteria. The following principles shall apply:*
  - *Distribution use of system charges (DUoS)/Network tariffs should reflect the utilisation of the networks and not be dependent on what the customer uses the network capacity for*
  - *It should be clear to customers how these prices are determined*
  - *Where cross-subsidies exist between customers, they should be justifiable and where quantifiable explicitly identified.*
- *To allow and facilitate cross-subsidisation in accordance with government policy.*
- *Tariff rates and structures should, subject to the NERSA approved cross-subsidy framework, accurately reflect the cost to supply different tariff categories. Where prudent, tariff structures should reflect the underlying cost structure.*
- *Tariffs should reflect the ring-fenced cost of retail and network services where this can be accommodated.*
- *There should be stability and predictability in tariffs in order to facilitate customer choices.*
- *There should be an optimal range of tariffs based on usage patterns to, as practically as possible, meet customers' requirements.*
- *Tariffs should be simple, transparent and understandable to the relevant target customer base.*
- *Customers should be charged connection charges for the cost of providing required capacity as prescribed in NRS069 and/or other relevant NERSA approved documents*
- *Where objectives are in conflict with each other, the NERSA will achieve an optimal balance through regulation. Where service providers are unable to meet all of the above objectives, they shall be required to prioritise and motivate the above objectives based on their specific economic and social circumstances."*

3 THE SA GRID TARIFF CODE

The SA Tariff Code provides the following tariff objectives for transmission tariffs (Section 2)

(1) NTC transmission tariffs shall be designed in pursuit of the following objectives:

- *Open access to the transmission services at equitable, non-discriminatory prices to all customers*
- *Pricing levels that recover the approved revenue requirements of service providers*
- *Predictable prices over time to customers*
- *Pricing signals that reflect the cost structure of the services provided*
- *Optimal asset utilisation*
- *Unbundling of service offerings and cost-reflective pricing of each service component*

4 ESKOM'S FUTURE ROLE FOR LONG-TERM SUSTAINABILITY

According to Eskom's approved future role for long-term sustainability,[9] "*Eskom needs to evolve the business model in order to stay relevant to the market and deliver on the mandate and to support economic growth in South Africa and the region.*

It is envisioned that:

By 2035 Eskom will be a technology centric, vertically integrated energy services company operating nuclear, clean coal, gas and renewables generation, selling and trading energy in South Africa (75% of sales) and Africa (25% of sales) and with a diversified revenue portfolio in regulated and deregulated markets.

In order to do this Eskom will:

- *Be an effective and efficient utility by pursuing operational excellence to leverage and maximise the value of the existing fleet whilst exploiting technology to improve productivity and focusing on zero harm.*
- *Retain, engage and grow customers by the integration of our products and services to add value to the customer.*

[9] Eskom's Future Role for Long-term Sustainability.

- *Diversify the future energy mix for power generation in Eskom and reduce our carbon footprint by investing in nuclear, clean coal, gas and renewables.*
- *Cost effectively enhance current and grow new transmission and distribution assets to distribute additional electricity and further increase the customer base by connecting new customers and IPPs.*
- *Be a technology company by conducting and applying focused R&D on technologies to address our current constraints, reduce costs, improve effectiveness and grow revenue through commercialisation activities.*
- *Diversify our revenue and leverage core competencies by expanding our activities into the deregulated and regulated markets in the region (noting, that electricity markets in SADC also have their own regulated markets) selling products and services in the non-regulated South African sectors (including investing in beyond the meter or off-grid generation and other solutions) and up-stream activities to control costs and acquire new revenue in adjacent markets such as gas.*

Eskom will need to optimise the use of its subsidiaries, Special Purpose Vehicles (SPVs), partnerships and Joint Ventures (JVs) to execute on its growth aspirations.

In order to do this and liberalise the market effectively, an enabling policy and regulatory framework is required. Eskom's position is that the Integrated Energy Plan and Integrated Resource Plan need to be reviewed and updated on an on-going basis to give more certainty to market players and respond to variations on assumptions e.g. demand growth.

The long term electricity industry structure and the associated market rules and regulatory environment also require more in depth analysis and clarification on the end state of the market in South Africa. In the evolution of the market structure and rules, all players in the market need to be treated in a fair, equitable and transparent manner that ensures all entities have sustainable business models.

Eskom will continue to play a key role in the South African energy market for many years to come. Eskom's key positions in this future role and why Eskom's role will benefit South Africa have been identified in this paper. On-going engagement with the shareholder and various stakeholders will be conducted to refine and conclude this position."

Appendix B – EPP Policy Positions

Policy Position1

a) The revenue requirement for a regulated licensee must be set at a level which covers the full cost of production, including a reasonable risk adjusted margin or return on appropriate asset values. The regulator, after consultation with stakeholders, must adopt an asset valuation methodology that accurately reflects the replacement value of those assets such as to allow the electricity utility to obtain reasonably priced funding for investment; to meet Government defined economic growth.

b) In addition, the regulatory methodology should anticipate investment cycles and other cost trends to prevent unreasonable price volatility and shocks while ensuring financial; viability, continuity, fundability and stability over the short, medium and long term assuming an efficient and prudent operator.

Policy Position 2

Electricity Tariffs must reflect the efficient cost of rendering electricity services as accurately as practical.

a) The average level of all the tariffs must be set to recover the approved revenue requirement.

b) The tariff structures must be set to recover costs as follows:
- The energy costs for a particular customer category.
- The network usage cost for a particular t consumer category and
- Service costs associated therewith.

Policy Position 3

The customer bill must comply with NRS047

Policy Position 4

All forms of discriminatory pricing practices must be identified and removed, other than those permitted under specific cross-subsidisation / developmental programmes, or be transparently reflected to unlock the full potential of electricity to all.

Policy Position 5

a) Fair and non-discriminatory access to and use of networks to all users of the relevant networks.

b) The full cost to operate the networks is reflected in the various connection and use of system charges and, therefore, no additional charges for wheeling of electricity will be levied unless the wheeling action introduces incremental costs.

c) Any incremental wheeling costs associated with a specific wheeling transaction and its fair share must be recovered as a connection charge.

d) Wheeling of electricity can only be permitted if the action complies with all technical, safety and commercial requirements.

e) A methodology for transmission and distribution wheeling, including the treatment of network congestion, must be developed by NERSA.

Policy Position 6

In addition to the standard range of pricing products provision must also made for the development and introduction of special products and prices to achieve specific goals, the cost of which will be treated according to the regulatory methodology.

Policy Position 7

NERSA, after consulting with stakeholders, should develop and publish a multiyear price path on an annual basis.

Policy Position 8

a) Electricity from both licensed generators in South Africa and from all approved importers of electricity to South Africa must fall within the scope of the EPP.
b) NERSA may apply certain exclusions in terms of predetermined criteria as prescribed by DME (e.g. private generators producing electricity for own use on the same site).

Policy Position 9

a) Generating pricing structures must reflect the cost of supply of the generator or alternatively any approved PPA.
b) Generator pricing structure can consist of the following; Capacity, energy and ancillary service charges.
c) Customers, who are able, must be given the opportunity to sell ancillary services to the market on a fair and non-discriminatory basis.
d) Generator pricing structures must not hinder efficient and least cost dispatch of the generating units.

Policy Position 10

a) The price paid for electricity generated in South Africa or imported to South Africa must be based on either the appropriate and approved regulatory method or on conditions set out in the approved PPA.
b) Electricity purchases from new supply options must be evaluated and approved subject to ex ante approval of the power purchase agreements
c) NERSA may approve a framework to expedite the determination and approval of prices from supply options (e.g. short term purchase!)

Policy Position 11

a) Preferably, renewable generators will compete with non-renewables in terms of price taking into account all forms of support (for examples. grants. soft loads. CDM, feed-in tariffs, green tariffs, tax incentive).
b) Alternatively, in the case where renewable support mechanisms are insufficient and State targets for renewables are thus not reached, renewables could be introduced at a price premium relative to non-renewables, subject to approval by NERSA.
c) Renewable power can be traded by the single buyer licensers or customers. Renewable power can be sold at a special price or the cost can be pooled with energy cost and form part of the charges to all customers.
d) The DME will develop a renewable energy guideline to support the introduction of renewable energy.
e) Any policy proposals on environmental support for electricity generators must be done by DME after consultation with DEAT and other relevant stakeholders.

Policy Position 12

a) Wholesale energy prices must encourage the efficient use of electricity at all times and must reflect the TOU structure differentiated cost of supply.
b) The wholesale energy price structure must be periodically reviewed and updated by the single buyer· and approved by NERSA.

Policy Position 13

a) Wholesale energy prices must cover the cost of wholesale purchases, including capacity, energy and ancillary services.
b) Wholesale energy prices must consist of the generator prices, plus the single buyer own costs.
c) NERSA must develop an over/under recovery mechanism to deal with mismatches between wholesale energy purchases and sales.

Policy Position 14

a) NPAs are permitted, but must be structured in a way so as to minimise price distortions.
b) Commodity price risk exposure must be hedged outside of the ESI.
c) Existing NPAs will be honoured until the end of contract.
d) The evaluation of NPAs at inception must be based on the cost of supply (excluding cross-subsidies) on a discounted cash flow basis over the period of the agreement.
   - The cost of supply for NPAs intended for the sale and consumption of electricity in South Africa must be defined by the electricity price forecast which will be based on the prevailing regulatory methodologies in South Africa inclusive of an appropriate risk premium.
e) DME *(now DoE)* must develop a transparent NPA application and approval process to ensure adequate evaluation and consultation with key stakeholders, including National Treasury.
f) DME *(now DoE)* must update the NPA pricing framework setting out the evaluation criteria. NERSA will approve and monitor NP As in accordance with the framework.
g) All applications must be treated in accordance with the approved processes and frameworks and be approved by NERSA.

Policy Position 15

a) NERSA must develop and implement a frame work for the pricing of international sales contracts.
b) International customers connected to the transmission system must not receive subsidies intended
c) For South African customers. South African customers must not subsidise the export of electricity.
d) International contracts will be subject to South African energy conservation legislation, regulations and rules.

Policy Position 16

a) The cost of ancillary services must form part of the wholesale prices.
b) The cost of providing generator standby services to all customers (including customers with own generator), must form part of the wholesale prices.

Policy Position 17

a) Transmission tariffs must be unbundled (e.g. charges for: TUOS. line losses. customer services and connection) to reflect more accurately the cost of supply.
b) Connection charges must be fair and calculated in accordance to a standard to be approved by NERSA.
c) The transmission tariff structure must reflect the cost of supply and could consist of a combination of capacity energy loss factors and fixed charges.

Policy Position 18

a) The transmission tariffs need to be set at a level that must allow the licensee to earn its approved revenue requirement.
b) Tariff levels must be determined in accordance with approved standards, codes, frameworks and other regulatory requirements.

Policy Position 19

a) Transmission network costs must be apportioned 50/50 between generators and customers to more accurately reflect the cost of supply.
b) Transmission losses costs will be allocated directly to loads.
c) Transmission service and other costs must be allocated rationally between loads and generators and must reflect the cost to provide the service.
d) The apportionment between generators and customers must be reviewed from time to time to ensure compliance with regional approaches in order not to disadvantage South African based generators.

Policy Position 20

a) The current transmission geographic differentials for customers must remain until it is succeed by an approved redefinition of geographic differentials.
b) The transmission licence holder, DME *(now DoE)* and NERSA must evaluate the redefinition of geographic differentials for customers assessing the price stability, comparing the current generation mix with that foreseen in the next 10 years.
c) The transmission license holder, DME *(now DoE)* and NERSA must investigate different options and adopt the most appropriate method for allocating costs between generators.

Policy Position 21

a) International SAPP operating members connected to the transmission network will pay the regulated transmission tariffs.
b) International customers will be required to pay connection charges in accordance with the connection charge policy.
c) The financing of connection assets for international customers will be in accordance with the connection charge policy.
d) Any wheeling by SAPP members through the Transmission network in South Africa must result in a payment to the transmission licensee for the wheeling service provided. The payment will be in accordance with SAPP rules for wheeling charges and will be recovered from SAPP members the approved trading entity.

Policy Position 22

a) Wholesale energy and transmission prices must be available on a fair and non-discriminatory basis to all qualifying wholesale electricity traders.
b) DME *(now DoE)* in consultation with NERSA must determine qualification criteria for wholesale traders and
c) NERSA determine implementation guidelines.

Policy Position 23

Electricity distributors shall undertake COS studies at least every five years, but at least when significant licensee structure changes occur, such as in customer base, relationships between cost components and sales volumes. This must be done according to the approved NERSA standard to reflect changing costs and customer behaviour. The cost of service methodology used to derive tariffs must accompany applications to the regulator for changes to tariff structures.

Policy Position 24

a) Licensees must undertake the required analyses to determine the extent of back log of maintenance / refurbishment and put strategies in place to catch up.
b) NERSA must give due cognisance to requests for additional funds to provide for capital and operating expenditure, including staff to manage such projects and undertake the required work.
c) The above must be done with due cognisance where proper ring fencing is not done and much of the needed funds are removed in a non-transparent fashion from the electricity sector.

Policy Position 25

a) NERSA must develop acceptable standards for non-technical losses and provision for bad debt.
b) The component of non-technical losses and bad debt which exceeds the approved standard must be considered unacceptable and be removed from the approved revenue base that would otherwise impact on the return of owners.

Policy Position 26

a) The number of consumer categories for tariff purposes should be justifiable to NERSA based on cost drivers and customer base:
   - consumption patterns e.g. usage in different times load factor and average consumption

- type of supply (l phase or 3 phase, capacity level, overhead or underground. urban versus farms, multiple connection points);
- type of metering (conventional or pre-payment, kWh, demand, TOU;) and
- Position on the network (not geographic location).
- Voltage of the supply and the system from which the supply is taken.

b) A new category must be created where costs differ by at least 10% between a group of customers and another based on the above criteria.

c) Sub-categories could also be created where only one or more components of costs differ significantly.

Policy Position 27

NERSA must see within five years that cost reflective tariffs shall reflect all the following cost components as far as possible:

- Energy costs in c/kWh;
- Network demand charges in R/kVA/period covering;
- Network capacity charges in R/kVA/month or R/Amp/month based on annual capacity;
- Customer service charges in R/cust/months;
- Point of supply costs R/POS/month; and
- Cost of poor power factor.

Policy Position 28

As a result of metering and billing constraints, tariffs for some customer categories will not reflect all the above components. The applicable charges must cover the full cost of all the above cost components.

Policy Position 29

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

Policy Position 30

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.

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.

Policy Position 32

TOU tariff energy charges must be differentiated by:

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

Policy Position 33

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.

Policy Position 34

Licensees shall apply pooling of costs per consumer category to achieved reasonable tariff.

Policy Position 35

Voltage and supply position differentials must be applied in tariffs within a licensed distributor as I 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 01 lower voltages and demand of tariffs at higher voltages.

Policy Position 36

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 which could contain tariff charges to reflect a basic charge, customer service charge, capacity charge and energy charge with cost-reflective connection charges; and
- At the next level a tariff which could contain tariff charges to reflect 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.

Policy Position 37

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.

Policy Position 38

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.

Policy Position 39

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.

Policy Position 40

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

Policy Position 41

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. The recovery of revenue by the licensee and charges for all consumers shall thus be based on the standard applied at each level in the network and in line with the investment criteria set out in the respective Grid codes of NERSA.

Policy Position 42

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.

Policy Position 43

a) Non-licensed traders 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.

Policy Position 44

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.

Policy Position 45

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.

Policy Position 46

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.

Policy Position 47

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

Policy Position 48

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

a) a single energy rate tariff;
b) with no fixed charge;
c) limited in capacity 1020 Amps ;and
d) nominal connection fee.

Policy Position 49

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 350kWh per month.

Policy Position 50

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.

Policy Position 51

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 by funded by municipal revenue and not from electricity income.

Policy Position 52

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 intergovernmental transfers.

Policy Position 53

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.
    - 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

Policy Position 54

a) Under no circumstances shall the new MSOE be introduced in addition to the current non transparent / unring-fenced surpluses.
b) NERSA shall regulate the electricity prices excluding the transparent MSOE.

Policy Position 55

The State, as the owner of public entities, must consider forfeiting dividend payments, making equity contributions and/or offering guarantee, if needed, to assist electricity utilities in maintaining appropriate gearing ratios and business indicators while incurring capital expenditure for the expansion and refurbishment of existing networks where appropriate increases in the tariff are not sufficient.

Policy Position 56

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.

Policy Position 57

a) NERSA must consider the impact and the effectiveness of DSM and energy efficiency in determining revenue requirements of licensees.
b) These implications must also be ringfenced and be reported on annually by licensees.

Policy Position 58

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.

Policy Position 59

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.
   - 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.

Policy Position 60

a) The regulator must decide on the amount of funds to be allocated to energy efficiency based on requests made by the licensee.
b) The funds shall be applied and prioritised on a security of supply and/or least cost per saved MW basis.
c) All parties in the ESI shall be treated fairly and independently based on the measure to which the application meets the qualification criteria developed by NERSA.

Appendix C – Summary of the previous Strategic Pricing Directions

1999

Proposed change		Action
1.	The introduction of network (or "wires") charges as a separate charge for most tariffs. Where this charge is demand based, apparent power (kVA) should be used.	Done – implemented for all relevant tariffs by Jan 2005
2.	The retention for some tariffs of a demand charge to recover some of the energy costs. In order not to penalise customers for poor power factor; where there are no significant costs associated with power factor, active power should be measured (kW).	Done - the energy demand charge retained in Nightsave Not measured in kW due to metering constraints
3.	The pooling of capital costs associated with making supplies available to customers. Network charges will therefore be based on R/kVA/km/month and will be voltage differentiated.	Not implemented as it was impractical.
4.	The scrapping of the up-front capital allowance, the cost of which is recovered through the basic charge.	Not implemented due to not implementing above.
5.	The discontinuing of the consumption-based rebate on monthly rentals as well as monthly rentals for existing customers and new customers.	Almost complete – just needs to be removed for Ruraflex and Nightsave.
6.	The discontinuing of the reactive energy charges (kvarh) for the TOU tariffs.	A decision was later made to keep these charges for the winter months
7.	Differentiating of basic charges (or monthly per customer charges) on 4 SPU customer size classes.	Done
8.	The alignment of the TOU time zones and seasons with the Wholesale Electricity Tariff.	Done
9.	The merging of Standardrate with Nightsave.	Done
10.	The possible regrouping of the supply voltages (for pricing purposes).	Not done due to major implications for low voltage supplies.
11.	The possible merging of Megaflex with Miniflex (studies still to be done to confirm the feasibility).	A decision was later made not to pursue this.
12.	Standard retail tariffs will reflect the underlying network tariff. • For larger customers the underlying Transmission tariff structure will be reflected in the retail tariff charges. For smaller customers this cost will be averaged in the tariff rates. • There will be a Distribution Network Levy (DNL) applicable to direct Transmission-connected customers to ensure a fair and equitable contribution to subsidies • Network charges will be differentiated on the basis of voltage and urban/rural differentiation for Distribution costs and for larger customers as per the Transmission tariff structure differentiation for Transmission costs. • Network charges will be recovered partly through a fixed R/kVA annual based charge and partly through a variable R/kVA monthly based charge or c/kWh based charge. • Eskom tariffs will continue to provide a cost signal for the impact that capacity required and utilised has on the network.	Done

13.	Where practical Eskom tariffs will contain both a load shifting (energy) and load reduction (capacity) signal. a) Where appropriate customers will be offered a choice of a TOU tariff that reflects the wholesale purchase tariff structure. b) For lower consumption customers in the absence of a TOU tariff, energy based charges should contain rates that provide economic signals for usage and capacity. c) Eskom' will offer tariff structures that give mutual benefit to the business and to customers d) Eskom will not offer fixed energy rate tariff structures to higher consumption customers. e) Eskom will offer tariffs combined with enabling technologies/products to promote energy efficiency.	Done
14.	Energy losses will be recovered using unbundled Transmission and Distribution loss factors based on the voltage of the supply and the geographic location	Done
15.	Tariffs will be designed to not expose the business or customers to undue revenue risk	Partially done
16.	Tariffs will recover adequate revenue to ensure reliability of supply.	Done
17.	Eskom tariffs will be structured to ensure a fair and economic balance between fixed and variable charges so as to provide benefit to the business and the customer.	Done
18.	The NMD rules will be updated from time to time, taking into account needs and risks of customers and the business.	Done
19.	Eskom will minimise the underlying cause of windfall benefits gained by customers from conversion between tariffs, such as the reduction of the differences in the rate rebalancing levy between tariffs.	Done
20.	Eskom will offer an optimal choice of tariffs.	Done
21.	The potential for customer to be able to respond to a pricing signal will be taken into account when designing tariffs.	Done
22.	Eskom will rationalise and remove inequities between similar tariff categories.	Partially done
23.	Bills will be simplified by publishing only rates inclusive of all factors applicable to the tariff component on the bill.	Done
24.	Any reduction in subsidies will only be done considering the full economic impact and under the guidance of national policy.	Not done
25.	The voltage level differentiation between the highest and the lowest voltage categories will be increased to a level that is more cost-reflective, yet not impact the lower voltage supplies on average by any significant percentage.	Only partially done, further reduction of subsidies still to be approved by Nersa

2006

Proposed change	Action
26. Unbundling of tariffs to reflect cost causation a. Reflecting of energy losses and network charge differentials separately – previously both differentiated by the same voltage surcharges and Transmission and Distribution charges were bundled. b. Energy losses are applied to energy charges through unbundled Transmission and Distribution loss factors based on the voltage of the supply and the geographic location.	Done Done Done

c. The introduction of Transmission and Distribution network (or “use-of-system”) charges d. For Distribution connected supplies, the network charge was split into a c/kWh or a R/kVA variable charge and a R/kVA fixed network charge based on the voltage of the supply and the urban/rural classification. e. For Distribution connected supplies an Embedded Transmission network charge was introduced based on the voltage of supply and Transmission Zone and for Transmission connected supplies a Transmission network charge based on the Transmission Zone. f. The introduction of a Distribution Network Levy (name later changed to a Distribution network demand charge for Transmission connected supplies) applicable to direct Transmission-connected customers to ensure a fair and equitable contribution to subsidies by all customers.	Done Done Done
27. Differentiating the service and administration charges on supply size categories	Done
28. The alignment of the TOU time zones and seasons with the WEPS	Done
29. The NMD rules were revised to allow for automatic exemptions for exceeding NMD by 5% or less and to introduce punitive charges when the NMD is above 5% and/or being consistently exceeded.	Done
30. Alignment of the electrification and rural subsidy charge between the large power user tariffs	Done
31. Since the last strategic direction Eskom has also implemented in addition to the above: • Introduction of use-of-system charges for generators. • Reducing the winter peak rate and commensurately increasing the summer peak and standard rates. • Introduction of a tariff called Megaflex Gen and Ruraflex Gen for customers that consume and generate at the same point of supply. • Introduction of a subsidised tariff called Landlight to cater for rural prepaid to small scale farmers. • Unbundling of network costs that were being recovered in the energy rates. • Unbundling of the low voltage subsidies from the network capacity and network demand charges into a low voltage subsidy charge.	Done
32. Eskom in 2012/13 also attempted structural changes to make the charges more reflective of the cost of energy, Transmission, Distribution and retail, but these were not approved by NERSA.	Not achieved