Connection charges for customers connected to the Distribution network

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1 Introduction

All customers (generators and loads) are required to make a contribution towards Eskom Holdings SOC Ltd's (Eskom) investment in networks, the cost of connection and providing capacity on networks. This contribution is regulated and recovered through:

a) Tariff charges; retail tariff network charges / DUoS charges recovering average costs.

b) Connection charges; a customer specific capital contribution recovering allocated connection costs in excess of the average costs. Connection charges include the following:

- Transmission and Distribution standard and premium connection charges
- Connection fees
- Conversion fees and other standard charges - refer to the Standard Charges schedule at www.eskom.co.za/tariffs

This document looks at the rules, philosophy, methodology and implementation associated with connection charges for Eskom Distribution connected supplies and complies with the **Distribution Code** and **NRS 069** (code of practice for the recovery of capital costs for distribution network assets).

For the rules on Transmission connected supplies refer to **Transmission Connection Charges Guidelines** as included in the **SA Grid Code**.

2 Supporting clauses

2.1 Purpose

This document provides the principles and rules for the calculation of connection charges payable by customers for Distribution connected supplies (generators and loads).

2.2 Informative

Parties using this document shall apply the most recent edition of the documents listed below:

- The Distribution Code
- Transmission Connection Charge Guideline (part of the SA Grid (Tariff) Code).
- The Electricity Regulation Act as amended.
- Electricity pricing policy produced by the Department of Energy.
- Nersa regulatory rules for the third party transportation of energy.
- NRS 069: Recovery of Capital Costs for Distribution Network Assets
- NRS 048 – Quality of Supply

2.3 Definitions

Refer also and in addition to the definitions contained in Eskom's schedule of standard prices.

Additional capacity: Additional capacity is the additional amount of power rated in kVA or kW that a customer adds to the existing notified maximum demand or maximum export capacity.

After diversity maximum demand (ADMD): The maximum demand to be catered for at a point in the network after taking into consideration the diversified (coincident) demand.

Allocated costs: All costs allocated as the cost of providing the capacity a customer requires, including where applicable, dedicated new costs, pro-rated new costs, actual upstream network costs and shared costs.

Available network capacity: Available capacity (for pro-rating calculation purposes) is the maximum limit of upstream network capacity at which point system strengthening is generally undertaken. This is not the maximum technical limit of the network and can also be referred to as the economic capacity.

Bank guarantee: A guarantee for an amount issued by a bank which holds an approved credit rating and is registered to carry on the business of a bank and constitutes a commitment to pay by the bank.

Basic connection: A single-phase ≤80A individual urban supply with a service connection up to 35 metres of underground cable or 80 metres of overhead LV conductor.

Budget quote: The offer to connect including the provision of financial terms and physical supply conditions subject to conditions negotiated between the participants.

Capital allowance: means the customer's contribution to dedicated connection assets and/or upstream assets to be paid by the customer at standard tariff rates for electricity to be consumed in future. The contribution to upstream and dedicated assets is recovered from the customer through network charges - i.e. average capital costs recovered over time at the tariff rates for electricity to be consumed in future. The capital contribution payable for the cost of providing new equipment is offset by the capital allowance.

Charging parameters: The component or unit used to charge a customer through a tariff. Typical charging parameters could be c/kWh, R/kVA and R/customer.

Code(s): The Distribution Code, the South African Grid Code, the Grid Connection Code for Renewable Power Plants or any other code, published by the Nersa, as applicable, and as amended, modified, extended, replaced or re-enacted from time to time.

Connection: The physical connection of the electrical installation to the Distribution System and/or the Transmission System.

Connection charge: The charge raised by Eskom from the customer towards the cost of the Eskom connection works in compliance with the Code. It is payable in addition to the tariff charges as an up-front payment. Prior to April 2009 customers had the option of paying a monthly connection charge where Eskom financed the connection charge.

Connection charge guarantee: A guarantee required to cover the remainder of the connection charge where upfront payments are allowed to be phased in terms of a payment schedule.

Connection fee: The minimum pre-determined connection charge.

Connection works: The planning, financing, insuring, land rights acquisition, design, engineering, procurement, supply, fabrication, construction, erecting, installation, inspection of the electricity network infrastructure comprised in the connection and all activities and requirements ancillary to these, and includes the customer connection works and the Eskom connection works, and in the case of self-build, the contract works.

Contract Works: The portion of the works undertaken by the customer/developer in the case of a self-build project that are to be handed over to Eskom to own, operate and maintain

Contract Works Security: A guarantee required to cover Eskom against any defects and deficiencies resulting from poor design, materials, workmanship, services or works used in the Contract Works

Conversion fee: The connection charge payable when there are tariff changes, meter changes, changes in installation or when a supply point is shifted.

Cost estimate fee: the portion of the connection charge paid by the customer to Eskom for the issue of the cost estimate letter.

Cost estimate letter (CEL): The letter issued by Eskom to the customer with a non-binding estimation of the Eskom connection works to connect the electrical installation to the Distribution System and/or Transmission System.

Dedicated assets and costs: Means those assets created for the benefit of one or a identified group of customers forming part of the Eskom connection works, created to meet the customer's technical specifications and on which, actual or existing total or pro-rated costs may be used in the calculation of the connection charge.

Defects Liability Period: in relation to (a) any defect or deficiency other than a Latent Defect, 24 months following the hand over and (b) any Latent Defect, 36 months following the hand over.

Direct network voltage supply: Where supply is taken at the same medium voltage (or higher) as the network, i.e. no transformation equipment is installed.

Distribution: The regulated business unit through which Eskom constructs, owns, operates and maintains the Distribution System in accordance with its Licence and the Code(s).

Distribution system: Eskom's network infrastructure consisting of assets operated at a nominal voltage of 132 kV or less, not classified as transmission transformation equipment.

Diversity: Diversity arises when two or more loads' maximum demand do not necessarily occur simultaneously. Customers with two or more loads receiving the benefit of diversity are charged on the simultaneous maximum demand and not the sum of the individual load's non-simultaneous maximum demand, which may be higher.

Early termination guarantee (ETG): An early termination guarantee is a guarantee provided by the customer to cover the value of the total irrecoverable costs in the event of the supply being terminated early by the customer.

Electrical installation: The actual electrical equipment and installation of the customer where electrical supply is taken.

Eskom: Eskom Holdings SOC Ltd.

Eskom connection works: The works required to be constructed, changed or enabled on the Distribution System and/or the Transmission System by Eskom including if applicable any Upstream Works and Monopoly Works but excluding the self-build works.

Estimated connection charge: The total estimated connection charge before adjustments for scope changes, inflation, force majeure and foreign exchange and commodity prices at final reconciliation stage.

Fast-tracking: Fast-tracking refers to the process where projects are rescheduled for completion on a date that is earlier than the original project completion date o where funding is not available.

HV (high voltage) network: High voltage networks usually consist of equipment supplied at a voltage greater than 22kV and consist of the distribution substations and networks. A substation is considered a HV substation when the primary side of the substation is supplied at a voltage > 22 kV.

Irrecoverable costs: Costs for labour, transport, dismantling and installations/equipment that cannot be re-used.

Latent Defects: a defect or deficiency of the Contract Works (fair wear and tear excepted) which is attributable to (a) any design for which the customer/developer is responsible, (b) any materials, plant facilities, equipment and assets or workmanship not in accordance with the self-build agreement or (c) any failure by the customer/developer to comply with any other obligation under the self-build agreement, and which is not discovered, or would not have been discovered by Eskom acting as a reasonable and prudent person, in the 24 months following the hand over.

LV (low voltage) network: Low voltage networks consist of a reticulation substation (mini-sub) or reticulation transformer and the service connection, normally supplying at 400/230 volts three-phase or 230 volts single-phase.

Major works: Underground cable network $\geq$ R1.5m or overhead line network $\geq$ R1m or supplies $\geq$ 1 MVA irrespective of project value.

Maximum demand: The highest average demand measured in kVA or kW at the POD/point of supply during a 30 minute integrating period in a billing month.

Metering installation: Is the meter(s) and the kiosk, the fittings, equipment, wiring and installations related to the meter(s) at the Point of Supply.

Minor works: Supplies < 1 MVA and underground cable network < R1.5m or overhead line network < R1m,

Monopoly works: Those non-contestable works forming part of the Eskom connection works which remain Eskom's responsibility under the self-build agreement to ensure a standard of work that meets Eskom's quality of supply, reliability and safety standards.

Monthly connection charge: A monthly connection charge is a monthly repayment of the required capital contribution where Eskom provides a customer with financing. See standard connection charge, premium connection charge or rebatable connection charge. This charge was previously called a monthly rental (MR).

MV (medium voltage) network: Medium voltage networks consist of the reticulation network, normally at 11 or 22 kV. Some rural networks with a voltage of 33 kV have been specifically designated by Eskom as rural reticulation networks. A substation is considered a MV substation when the primary side of the substation is supplied at a voltage $\leq$ 22 kV.

N-1: A design standard that will ensure single contingency in security of supply.

National average prices (NAP): Where a national average standard price is used in place of actual costs. The purpose of using national average prices is to ensure a consistent and simplified approach to charges and to ensure that customers are charged fair, equitable and average related costs.

Notified maximum demand (NMD): The contracted maximum demand notified in writing by the customer and accepted by Eskom per POD/point of supply. Note: The notification of demand is governed by the NMD rules.

NRS 048: The quality of supply standards issued by the South African Bureau of Standards, as revised from time to time or as replaced by a national standard.

Payment schedule: The schedule of connection charge estimate instalments and corresponding instalment payment dates as may be amended by Eskom from time to time in accordance with the budget quote.

Point of delivery (POD)/point of supply (POS): means either a single point of supply or a specific group of points of supply on Eskom's System from where electricity is supplied to the customer by Eskom or from where the customer supplies electricity to Eskom's system located within a single substation, at which electricity is supplied to the customer at the same declared voltage and tariff. Note: This can be a metering or summation point.

Premium connection: A connection made or to be made between the electrical installation and the Distribution System or the Transmission System based on the customer's requirements, that are in excess of the specifications of a standard connection and includes the acquisition and installation of the premium equipment.

Premium connection charge (PCC): That portion of the connection charge payable for costs associated with the premium connection included in the scope of the Eskom connection works.

Premium equipment: The equipment to be constructed or to be installed if the customer elects a premium connection, and is in addition to and/or in place of the standard equipment. The premium equipment shall comprise the equipment listed in the Electricity Supply Agreement.

Premium supply: Where the customer's specifications result in equipment to be installed above the least life-cycle cost requirements.

Premium assets: The equipment associated with providing a premium supply.

Project costs: Project costs are the total estimated actual costs for new capital investment, including if applicable pro-rated actual costs.

Pro-rating of costs: Where costs are apportioned based on capacity required/capacity available.

Quotation fee: The portion of the connection charge paid by the customer and received by Eskom for the issue of the budget quote.

Rebatable connection charge (previously the rebatable monthly rental): The rebatable connection charge or RCC was previously a monthly repayment of a capital contribution where Eskom provided a customer, who qualified for a consumption rebate, with financing. The calculation of the RCC was based on a maximum repayment period of 25 years at a given interest rate. Consumption or demand-based rebates were applicable on RCC.

Residual rebatable connection charge: The 2005 structural tariff changes resulted in all the Rebatable connection charges receiving a once-off reduction of their consumption rebate. The residual amount is referred to in this document as the residual rebatable connection charge and is subject to further rebates not beyond extinction.

Recoverable costs: These are any costs to be recovered from a customer or a third party for work done that is not associated with a change in capacity.

Recoverable work: Work performed not for the purpose of establishing a new connection or enhancement – e.g. the shifting of a line. The cost of this work is always recovered up front from a customer or where a third party is liable for the cost of such work i.e. it is never pooled into the tariff rates. This could typically arise where Eskom acts as a contractor. These costs should not be confused with "recoverable costs".

Refurbish: means to restore a supply/equipment to a former good condition by either replacing with similar components or updating with newer technology than the original equipment/supply.

Residential 1: Freehold - Full title stand normal domestic. A single point of electrical supply to be provided for each stand on the boundary of the stand at a designated position agreed to by the local authority and the customer. Each stand is metered separately by the local authority with suitable (already approved) tariff meters. **Note:** Maximum one point of supply allowed per stand. The Developer is responsible for the provision of internal MV and LV reticulation of services in accordance with Eskom standards and specifications for the power equipment to be used as well as the electrical infrastructure layout and positioning as approved by the Eskom Project Engineer.

Residential 2: Freehold - Clusters (high and low density). A single point of electrical supply to be provided for each cluster on the boundary of the portion of land that the cluster is situated on as agreed to by the local authority and customer. Each of the cluster houses to be metered separately by the local authority with suitable (already approved) tariff meters. Each cluster to be positioned on its own subdivided portion of the subdivided land as per the Surveyor General approved plan. **Note:** Maximum one point of supply allowed per cluster. The Developer is responsible for the provision of internal MV and LV reticulation of services in accordance with Eskom standards and specifications for the power equipment to be used as well as the electrical infrastructure layout and positioning as approved by the Eskom Project Engineer.

Residential 3: Sectional Title – Townhouses (high and low density). These dwellings are normally 'stack' units all positioned on one piece of land which is not subdivided into smaller portions on which units are to be positioned (as with cluster housing). The Body Corporate of the townhouse complex is the account holder. A bulk supply is delivered to the sectional title development on the property boundary of the development including a bulk meter point (thus all of the townhouses are metered through one meter point).

Rural line: Medium voltage networks normally at a supply voltage of 11 or 22 kV. Some rural networks with a voltage of 33 kV have been specifically designated by Eskom as rural reticulation networks.

Rural tariffs/areas: Areas classified as rural by Eskom for the purposes of tariff design and classification.

Self-build: The planning, financing, insuring, land rights acquisition, design, engineering, procurement, supply, fabrication, construction, erection, installation, inspection, pre-commissioning, testing, completion and commissioning of the contract works by the customer, and on completion of the contract works the handover of the plant, facilities, equipment, assets and related designs, material guarantees/warranties, deeds and other documentation by the customer to Eskom.

Self-build agreement: The contract to be concluded between Eskom and the customer pertaining to the contract works undertaken by the customer, and the monopoly works failing under the responsibility of Eskom.

Service connections: The service connection consists of the equipment connecting the customer to the reticulation network. This usually includes the switchgear, cables/lines and metering.

Shared network charges (SNC): These are national average charges raised outside of the tariff rates for the shared costs of networks (line and capacity). These charges are applicable to urban and rural tariffs and are used to calculate the connection charge payable by the customer for upstream costs.

Simultaneous maximum demand (SMD): The highest simultaneous load, measured in kilovolt amperes, supplied in any demand-integrating period of 30 consecutive minutes in the month, arithmetically summated over the points of delivery where a customer has multiple points of delivery.

Standard connection: A connection made to or to be made between the electrical installation and the Distribution system and/or Transmission system based on the least life-cycle costs design that meets the specifications of the Codes for a technically acceptable solution.

Standard connection charge: A charge that is payable for costs associated with the standard connection.

Standard equipment: the Eskom connection equipment to be constructed or to be installed if the customer elects a standard connection. The standard equipment shall comprise the equipment listed in the Electricity Supply Agreement.

Standard supply: The least cost technological investment as per Eskom standards required to provide an adequate supply in terms of NRS 048.

Tariff: A combination of charging parameters applied to recover measured quantities such as consumption and capacity costs and unmeasured quantities such as service costs. Refer to Eskom's schedule of standard prices for the list of tariffs and their charges.

Temporary supply: A supply to a customer that is of a temporary nature that is not for an indefinite period.

Transformation Capacity Charge: the charge included in the Transmission Connection Charge for the use of transmission transformation assets that are dedicated to a CUSTOMER or to a group of CUSTOMERS. The transmission transformation assets may be new or existing and would have been paid for fully or partially by customers either through Transmission Connection Charges or through Transmission use of system charges.

Transmission connection charge: That portion of the connection charge associated with the Transmission System, which may comprise of the Transmission standard connection charge and the Transmission premium connection charge.

Transmission premium connection charge: That portion of the connection charge associated with a premium connection and the Transmission System.

Transmission standard connection charge: That portion of the connection charge associated with a standard connection and the Transmission system.

Transmission system: Eskom's electricity system consisting of all lines and substation equipment where the nominal voltage is above 132 kV or where the nominal voltage is lower than or equal to 132 kV and there are no Distribution System assets.

Urban tariffs/areas: Areas classified by Eskom as urban for the purposes of tariff design and classification.

Upstream assets/cost: Assets created and used for the benefit of many customers and whose costs cannot be directly allocated to one or an identified set of customers at the time of connection.

Wayleave agreement: The right of way obtained from a landowner, who signs an agreement with the supply authority. A wayleave agreement is not registered against the title of the property.

2.4 Abbreviations

Abbreviation	Description
BQ	Budget quote
CEL	Cost estimate letter
DUoS	Distribution use-of-system
ADMD	After diversity maximum demand
CT/VT	Voltage and current transformer
EIA	Environmental impact assessment
ETG	Early termination guarantee
HASS	Historically above standard supplies
HV	High voltage
LV	Low voltage
MCC	Monthly connection charge
MEC	Maximum export capacity
MMU	Mobile metering unit
MRT	Mobile reticulation transformer
MTS	Main transmission system
MV	Medium voltage
Nersa	National Energy Regulator of South Africa
NMD	Notified maximum demand
PCC	Premium connection charge
PV	Present value
RCC	Rebatable connection charge
SNC	Shared network charge
SCC	Standard connection charge

3 Connection charges procedure for customers connected to Eskom's Distribution network

This document sets out the procedure and rules applicable to the raising of connection charges by customers connected to Eskom's Distribution networks.

The customer is required to pay the difference between the capital cost incurred by Eskom to provide the connection works (the work required to construct a new connection/bring about changes to an installation/provide additional capacity) and the tariff, as a connection charge.

The Transmission connection charges are provided by Transmission and are calculated in accordance with the SA Grid Code (the **Transmission Connection Charge Guideline). The Transmission connection charges** are added to the Distribution connection charges, if the customer is connected to the Distribution system, and Connection charges approach (deep vs shallow)

Network costs are recovered through either charges for connection to (connection charges), and use of distribution networks (tariff charges). The "boundary" between what is payable as a connection charge and what is recovered through the rate base (tariff charges) determines the allocation methodology.

- "**Deep" connection charge boundary**.
  - As much costs as possible are allocated to the connection charge and as little as possible to the rate base.
  - In this case the customer could be allocated upstream costs and even maintenance and operational costs.
  - Eskom applies a deeper connection charge approach with regard to actual costs for premium connections or where funding is not available.
- **"Shallow" connection charge boundary**
  - A portion of the costs are allocated to the connection charge and the remaining portion to the rate base.
  - For loads connection charges are based on dedicated costs plus a contribution to upstream costs, less what is recovered in the rate base (the capital allowance).
  - For generators, the connection charge is based only on dedicated costs and all upstream costs are recovered through the rate base.
  - Transmission also applies a shallow connection charge boundary approach in the calculation of the Transmission connection charges.
  - Eskom applies a shallow connection charge approach when funding is approved and available.

Under each of these approaches, the rate base through network charges will recover some portion of the cost of strengthening or connecting to the grid and providing the required capacity, and connection charges the remaining portion. The following pros and cons for a deep versus shallow approach were considered when developing Eskom's policy and procedure on connection charges.

Deep and shallow connection charge approach

	Pros	**Cons**
Deep	Provides a strong marginal costs and locational signals for the cost of locating at different points on the network. Apportions much of "blame" of the cost as possible to the customer causing the cost.	Significant barrier to entry. It imposes all the upstream costs on the marginal user that triggers the reinforcement and leads to free-riding problems for second comers – unless an administratively complex method is used to raise and refund the shared costs
	Minimises the risk of assets being stranded.	As a result of when the customer chooses to connect to a system, a customer may or may not be faced with prohibitive reinforcement costs. This is not equitable or fair treatment of customers.
	Will reduce the investment to be made by the distribution business and the capital requirements. Existing customer's network charges are not impacted by new customers connection costs	If all the costs are recovered in connection charges and not though tariffs it becomes difficult to reflect ongoing costs that a customer may impose on the system. A return is not allowed on assets funded by customers. A deep connection charge approach therefore can potentially over time erode the asset base on which returns may be earned. Not getting returns on at least some of the connection assets also impacts tariffs into the future when the asset needs to be replaced or refurbished.

	Pros	Cons
Shallow	If a shallow connections policy is coupled with pricing signals that contain locational network charges, the tariff plus connection charge can provide just as strong locational signals with regard to siting decisions.	It is more of a socialised cost approach where existing customers contribute to the connection costs of new customers Provides much weaker locational price signals for upstream costs, although they do not disappear for dedicated costs.
	Tariff charges can also provide a means of reflecting on a more real time basis the impact that changing conditions on the network have on the costs imposed by parties.	Does not accurately reflect the costs of system reinforcement that may be required which can result in more significant system reinforcement being undertaken than would be the case with a shallow or deep connection policy.
	Properly designed tariff charges would give appropriate locational signals and overcome these drawbacks.	If tariff charges do not provide appropriate locational signals, then a shallow connection policy may lead to costs that significantly raise the tariff charges paid by all users.
	As the connection charge is reduced it removes the barrier to entry for new connection.	Network charges must be allowed to include the costs of system strengthening not included in connection charges.
	Overcomes the problems associated with prohibitive marginal connection costs and free-riding.	
	More easily explained to customers.	
	Encourages competition in the provision of connections, since the assets that need to be delivered are well defined.	

The Eskom methodology is summarised in the following figure:

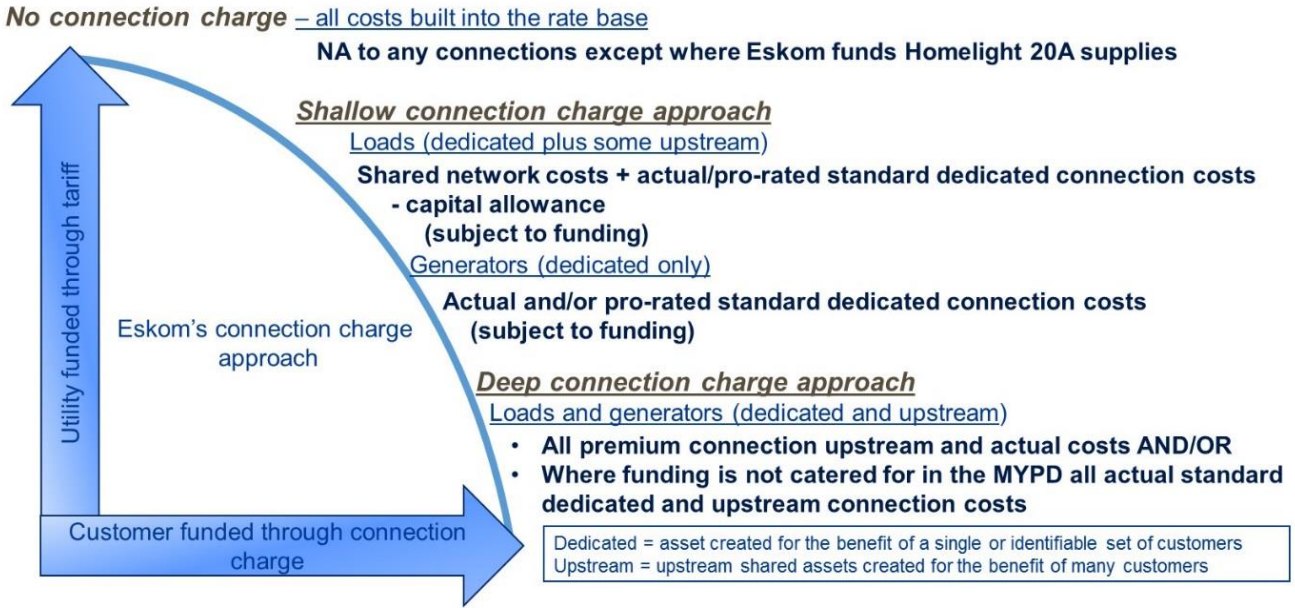


Figure 1: Deep/shallow connection charge approach and dedicated/upstream allocation of connection costs

Refer further to paragraph 3.2.2 for how dedicated and upstream costs are allocated.

3.1.1 Loads

For loads Eskom's connection charge methodology is a shallow approach where the customer pays for dedicated costs plus a contribution to upstream costs, which is then rebated by the amount recoverable through the tariff i.e. the capital allowance. A very shallow connection charge approach is not considered fair or feasible as it provides no signal for the cost of connection and allows new connections to impact the cost of existing tariffs.

This ensures that there is no free riding and that all customers make an equal and fair contribution to the cost of upstream networks while preserving an appropriate signal to customers regarding the cost of providing capacity on upstream networks.

Network charges contain the average network capital costs and if the customer is charged for the full dedicated costs plus a contribution of upstream costs, this customer may be double-charged for the cost of the same network. For this reason a capital allowance is given based on the amount of revenue to be recovered through the network charges related to capital. The connection charge is therefore off-set by the capital allowance. This means that Eskom needs to fund and budget for the actual cost portion of capital allowance. A deep connection charge approach will be applied if funding is not available and not included in the budget i.e. the customer may be required to pay all associated actual costs attributable to the capacity required.

3.1.2 Generators

For generators, Eskom's connection charge policy and methodology is a shallow approach i.e. the generator pays the dedicated cost as a connection charge and the actual upstream costs are socialised and recovered from all customers through the standard retail tariff network charges (i.e. the rate base).

The reason for socialising the actual upstream costs for generators is that upstream infrastructure is created to evacuate the power that will be used by consumers (loads) of energy.

This means that Eskom needs to fund and budget for the upstream actual cost portion of the connection cost. A deep connection charge approach will be applied if funding is not available and not included in the budget i.e. the customer may be required to pay all associated dedicated and upstream actual costs attributable to the capacity required.

3.2 Initial classification of type of connection

Before costs are allocated and the capital allowance is applied to determine connection charges, the correct methodology must be applied to calculate the connection charge i.e and the connection must be classified as follows:

- Generator or a load or both?
- Rural or urban customer?
  - Major vs minor works?
- Dedicated or upstream?
- For an SPU or an LPU customer?
- Standard or premium?

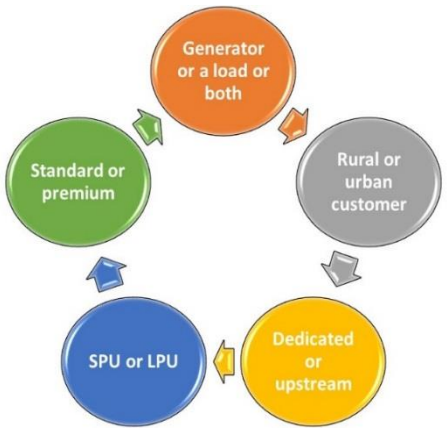


Figure 2: Selection of type of connection

3.2.1 Urban and rural differentiation

The connection charges methodology used to determine how the connection charge is calculated is firstly dependent on whether the applicant is to be classified to be a rural or urban connected customer for pricing purposes. This is also used to determine the allowed tariffs to be applied to the connection.

- Rural connections tend to have higher tariffs but lower connection charges due to the significant capital allowances i.e. a large portion of the connection is funded through tariff and subsidies.

- A portion of the connection cost is included in the tariff rates and subsidies of the rural tariffs making it more affordable for the customer to be connected but increasing the rural tariff charges.
- For rural tariffs the allocation of costs is dependent on whether or not it is a minor or major works project. For major works actual costs are always used and for minor works NAP is used.

- Urban connections tend to have lower tariffs but higher connection charges.

Refer also to NRS 069, which is a condition of the Distribution Code in determining whether a connection will be rural or urban.

3.2.1.1 Urban

The supply and tariff to an applicant will be considered to be urban when any one of the following conditions are met:

- The supply voltage is > 22kV (except where a 33 kV network is used to supply rural customers), or
- where the supply voltage ≤ 22 kV:
  - and is taken directly from a Distribution substation and not from a rural feeder, and/or
  - the connection requested is an end-use customer in a proclaimed township or is within a proclaimed township as determined by the municipality, or
  - as per NRS 069, the number of end-use connections within a 1 km radius of the particular point of supply exceeds 314. Areas where there is a higher density of connections required as in the case of one connection per 1 hectare plots, would be considered as urban. The particular point as a guideline is the closest reticulation transformer to the customers. All end-use connections within the particular area will then qualify as urban, or
  - the number of current and newly applied end-use connections per kilometre of MV line exceeds 44 and there are at least 40 connections in one development, or
  - the connection is in or from an electrification area funded through the Integrated National Electrification Programme (INEP), or
  - schools and clinics on a rural networks may be given an urban residential tariff or Businessrate. This is the only exception allowed for rural customer to be on an urban tariff. In order to qualify for the residential urban tariff, no rural capital allowance is given and all actual costs are payable.
- Rural networks/customers may only be reclassified as urban subject to the above criteria.

3.2.1.2 Rural

Rural networks are supplies taken from 11 and 22 kV feeders (or where a 33 kV voltage has been required to reticulate) that do not qualify in terms of the urban definition above. Rural networks are typically feeders where customers are sparsely located along the feeder, i.e. one customer per transformer with a significant distance between customers i.e. low density. A municipality point of supply will be classified as rural if the point of delivery is on a rural feeder.

3.2.2 Dedicated and upstream connection cost differentiation

Connection costs are allocated on the basis of a deep or shallow connection charge approach and whether an asset is upstream or dedicated. The following sets out the criteria to be used to determine whether an asset is considered dedicated or upstream:

3.2.2.1 Dedicated assets

- Assets only used by a single customer or an identifiable group of customers and is allocatable to the customer through a connection charge.
- A dedicated asset may be a new asset or an existing asset whose cost is allocatable to the customer.
- A dedicated asset's costs must be pro-rated where the capacity installed is in excess of any one customer's requirement, and where the cost can be clearly allocated through pro-rating to a number of identifiable customers.
- A dedicated asset is never considered an upstream asset.

3.2.2.2 Upstream assets

- Upstream assets are assets used for the benefit of many customers and that cannot be directly allocated to one or an identified group of customers.
- Typically assets at voltages higher than the connection.
- Upstream costs may be allocatable to loads (but then reduced by the capital allowance) and not normally allocatable to generators, unless there is a funding constraint (see paragraph 3.3).

3.2.3 LPU or SPU classification

The connection charge methodology depends on whether a customer is classified as an LPU or SPU customer.

3.2.3.1 LPU

Large power users (LPU) refers currently to supplies on the following tariffs:

- Urban LPU: Megaflex, Miniflex, Megaflex Gen, Nightsave Urban and Homepower Bulk*
- Rural LPU: Ruraflex, Nightsave Rural, Ruraflex Gen.

3.2.3.2 SPU

Small power users (SPU) refers currently to supplies on the following tariffs:

- Urban SPU: Homelight, Homepower, Homeflex, Businessrate, Public lighting and Homepower Bulk*
- Rural SPU: Landrate, Landlight

*Homepower Bulk can treated as either LPU or SPU depending on size.

3.2.4 Standard and premium supply classification

The connection charge methodology depends on whether the supply is considered a standard supply or a premium supply. Refer also to the Distribution Network and Tariff Code for more detail on premium and standard supplies.

3.2.4.1 Standard supply classification

Where the investment for a new supply or for refurbishment satisfies least life-cycle cost, technically acceptable solution to provide a quality of supply as required by the Distribution Code, this would be considered a standard supply and a standard connection charge would be raised for this supply.

- Eskom will determine the minimum technical criteria for a standard supply. Customers cannot insist on a technical solution that provides a supply lower than the Eskom standard.
- Where there are different technical options available, Eskom will select the option that is technically, financially and economically the least life-cycle cost option, not necessarily the cheapest. This includes the technical standards for a self-build supply.
- The least life-cycle cost will consider the quality and reliability of supply for a particular customer category.
- This may mean that if an N-1 supply is the minimum technically acceptable solution, then in this case the supply would be a standard supply.
- Maintenance costs of standard equipment are recovered through the tariff rates and are not allocated in the connection charge.
- The refurbishment of standard connections is recovered through the tariff – see paragraph 3.10.3.

3.2.4.2 Premium power supply classification

Premium connections are those where the customer requires a supply that is above the standard i.e. cannot be justified in terms of the Distribution Code as a standard connection. This additional cost above the standard supply is payable as a premium connection charge. Note that Eskom does not contract for "firm" supplies- only a supply that provides a greater reliability of supply than the minimum acceptable technical solution or technology above the standard.

Refer to paragraph 3.9 for the calculation of the connection charge for premium supplies.

3.2.5 Generator and load classification

The connection charge raised to customer depends on whether the customer is a generator or a load or a combination of the two.

3.3 Funding by Eskom of customer related connection costs

Eskom shall apply for the standard connection costs a shallow approach for loads and for generators. The timing of the customer connection is subject to such capital expenditure being approved by Nersa to be recovered through tariffs and the Eskom allocation of the funds.

If funding is not available for the Eskom portion of the connection costs, the customer will be provided the choice of a later connection date when such funding is approved, or to expedite the connection by paying the connection costs using a deep connection charge approach.

For a premium supply, a deep connection cost approach is used for all dedicated and upstream assets.

Where funding is not available the following amendments must be made to all the relevant connection charge calculation formulae contained further in this document:

Equation 1 Calculation of connection charge when funding is not available (loads)

Refer to
Equation 13: Calculation of standard connection charge urban or Equation 8: Calculation of Landrate, Landlight 60A, Nightsave Rural and Ruraflex connection charge - with the following amendment regarding the capital allowance:
- Capital allowance on SNC costs only, i.e. no capital allowance on any actual costs
No prorating will apply i.e. 100% of costs will be allocated

Equation 2 Calculation of connection charge when funding is not available (generator)

Refer to
Equation 13: Calculation of standard connection charge urban or Equation 8: Calculation of Landrate, Landlight 60A, Nightsave Rural and Ruraflex connection charge- with the following amendment regarding any upstream costs:
+ All actual upstream costs must be added to the allocated costs.
No prorating will apply i.e. 100% of costs will be allocated

Note: Where SNC is not applicable the Capital Allowance is R0. The same principle will apply to rural supplies.

3.4 Capital allowance (applicable to loads only)

The capital allowance is the average amount of capital recovered over a period of time through the tariff rates and is applicable to the connection charge of loads only (shallow boundary approach). The connection charge allocated to the customer is reduced by the capital allowance to ensure that customers don't pay twice for the same network costs i.e. capital included in the tariff. Refer further to Appendix 1 for details of the how the capital allowance is applied.

3.5 Allocation of costs for loads and generators

Cost may be actual costs 100% allocated to a customer or pro-rated, or charged as a shared network charge (SNC). The rules for allocating costs to both generators and loads are:

- A dedicated asset's costs is either allocated 100% or pro-rated (if funding is available) if potentially shared to calculate the connection charge. Pro-rating may apply on existing and new assets. For existing assets replacement costs or SNC whichever is lower must be used to allocate costs.
- If a Transmission Connection charge is allocated, this is payable in addition to the Distribution Connection charge. The Transmission connection charges may also include a Transformation Capacity Charge which is an allocation of an existing dedicated transformation asset that is needed to supply or evacuate energy needed/generated by the customer.
- Upstream costs will be allocated to loads using SNC but are not allocated to generators in calculating the connection charge.
- Refer to paragraph 3.2.2 to determine whether an asset is to be considered upstream or dedicated.
- Where an asset is considered to be dedicated and unlikely to be shared the full cost is to be allocated to the customer AND no pro-rating of the cost is to be done.
- Where an asset is dedicated to one customer but is likely to be shared now or in the foreseeable future (Eskom's planning horizon and included in the approved MYPD), then the cost should be pro-rated. Subsequent customers (loads and generators) will also be required to pay a pro-rata share of the asset or SNC if costs are no longer known.
- If the asset was originally considered dedicated but is later shared:
    - For loads, the subsequent customer's connection charge must include the correct pro-rated share of connection works and this must be refunded to the original customer once the subsequent supply is connected (refer also 3.14.1).
        - If the connection charge was a previously financed monthly connection charge (MCC), the existing MCC must be reduced to account for this sharing.
    - For generators, the principle is slightly different. A share shall apply in cases where a subsequent customer makes use of the connection assets funded by the original customer. This shared cost, shall, however not be paid to the original customer but would be paid to Eskom. The same principle of each customer paying a proportion of the shared asset costs shall also apply in this case (refer to paragraph 3.14.2).
        - This approach is applied because the cost of the connection works is included in the energy price/cost of the IPP and a refund will result in a windfall benefit for the IPP. This approach treats Eskom generators and IPPs selling to Eskom or other parties equally (refer also to paragraph 3.14.2).
- For loads a capital allowance rebates the allocated connection cost, but is taken into account when calculating the ETG (refer to paragraph 3.12.2.)
- Metering cost is ignored for all tariffs except Homelight and Homepower in the determination of the connection charge as this cost is recovered in the administration charge , but taken into account when calculating the ETG (refer to paragraph 3.12.2.)

The rules applicable to allocation of costs for embedded generators are:

- If funding is available, generators will pay for all dedicated costs, but are not required to contribute towards any costs that are defined as upstream.
- If funding is not available dedicated and upstream actual cost (pro-rated if additional capacity is installed for other customers to be connected) will be allocated.
- It is possible that an asset, at the time of construction, is considered dedicated but the costs will be pro-rated due to the potential of sharing. In this case the generator will pay a pro-rated connection charge for this asset.
- There is no capital allowance given on connection charges for generator connections.
- Pro-rating of generator costs will not take into account any load connected to the same network i.e. assumes if there is a full loss of load the network can evacuate the power.

Equation 3: Allocation of costs for an embedded generator connection where funding is available

Actual dedicated (can be pro-rated) plus if sharing of an existing dedicated asset is applicable, pro-rata share of the dedicated cost based on MEC/installed generation capacity

The installed generation capacity to be used will be the capacity assuming full loss of load i.e. where there are loads and generators connected to a network and all loads stop consuming

Equation 4: Allocation of costs for an embedded generator connection where funding is not available

Actual dedicated (can be pro-rated) plus if sharing of an existing dedicated asset is applicable, pro-rata share of the dedicated cost based on MEC/installed generation capacity
+ Upstream costs (pro-rated if applicable)
The installed generation capacity to be used will be the capacity assuming full loss of load i.e. where there are loads and generators connected to a network and all loads stop consuming

The following figure demonstrates allocation of costs:

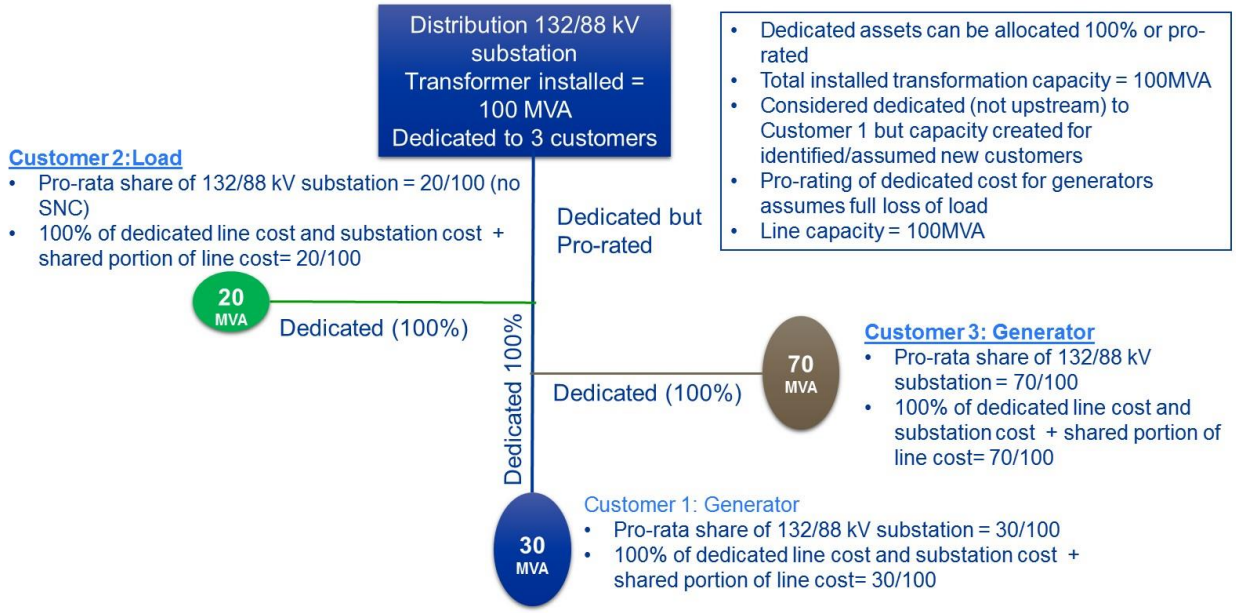


Figure 3: Allocation of dedicated costs for embedded generators and loads on the same network

3.6 Allocation of costs through SNC or pro-rating for urban loads and generators

Allocation of costs based on prorating or SNC may occur on both upstream and dedicated assets (refer to paragraph 3.2.2). This section deals with the rules associated with when SNC is to be applied and when pro-rating is to be applied.

New customers taking supply, whose requirements obligate Eskom to undertake upstream network strengthening investment in order to provide the supply, run the risk of having to make a substantial contribution towards upstream costs incurred by Eskom if they were charged for the cost of this upgrade. Also subsequent customers taking new supplies from the same network infrastructure may end up not having to make any contribution towards Eskom's costs as the capacity was paid for by the first customer, i.e. it leads to free-riding where subsequent connections benefit from using assets for which a previous customer has already paid.

The methodology for allocating sharing of dedicated or upstream costs, is:

Loads

For loads, to ensure that the first customer is not penalised and to avoid free-riding Eskom has developed a fair solution to this problem where all customers requiring new supply or additional capacity, are allocated a portion of the upstream costs irrespective of whether or not actual costs are incurred through shared network charges (SNC).

This ensures that all load customers make an equal and fair contribution to all new and existing network infrastructure. No customer is unfairly penalised by having to contribute towards the actual investment expenditure incurred by Eskom simply because at the time of taking supply no existing capacity is available.

- For dedicated costs the costs may be pro-rated or allocated 100%.
- The cost of work done at voltages higher than the primary side of the supply being taken is generally allocated for loads as an SNC or pro-rated and through the tariff.
- The upstream costs are allocated through a standard pre-determined shared network cost (SNC) based on replacement cost of like assets and considering diversity of the customer's load and generation connected or by pro-rating or actual costs.
- For rural networks, in addition to SNC or prorated actual costs sharing of line costs may apply.
- Where there is both generation and loads connected to a point considered dedicated, the pro-rating will be based on assuming full loss of load.

Generators

- For dedicated costs the costs may be pro-rated or allocated 100%.
- Upstream costs are ignored for generators in the determination of the connection charge, but taken into account when calculating the ETG (refer to paragraph 3.12.2).
- The cost of work done at voltages higher than the primary side of the supply being taken is generally allocated for generators only through the tariff (i.e. not charged as a connection charge).
- Where there is both generation and load connected to a point considered dedicated, the pro-rating will be based on assuming full loss of load.

3.6.1 Pro-rating of actual costs (new and existing infrastructure)

Pro-rating of actual dedicated or for loads upstream costs happens where new infrastructure that has redundancy either deliberate or due to standard equipment's capacity, is constructed and is likely to be shared by other customers and the costs are known, whereas SNC (refer to paragraph 3.6.2) gets charged to loads where infrastructure exists but the actual cost of this infrastructure is no longer easily determined. It is possible that an asset may be identified to be dedicated as it is for the benefit of a select number of customers and not the general customer base.

The rules for using pro-rated costs are:

- Prorating applies to new assets or to assets where the costs are known and may be subject to funding.
- If the connection works are likely to be shared by more than one customer the cost of the asset must be prorated. If the connection works is unlikely to be shared by other customers, irrespective of redundancy of the connection works due to minimum technical standards, the customer will pay full costs, i.e. no pro-rating will be applicable.
- Where pro-rating applies it will be applied to all new work or where costs are known based on NMD ÷ the total installed capacity. Only a portion of the actual costs should be allocated to the customer as the rest of the connection works will be used to supply other customers or to strengthen the Eskom system.
- Pro-rating will be done on an R/kVA/kW capacity basis and for rural networks using R/kilometre (refer to paragraph 3.6.5).
- The kVA/kW used for calculating the share of new work (or if applicable existing assets) is the customer's NMD/MEC unless ADMD is specified.
- For loads:
  - Where a load has funded the cost of the network, a pro-rata share will be raised to the next customer and refunded to the first customer (and all following customers), refer to paragraph 3.14.1.
  - Where previous generators or loads have been charged a pro-rata share on assets considered dedicated, any new load must be also allocated a pro-rata share of the asset using actual costs or SNC, as applicable.
  - Where actual costs are not known SNC will apply on the NMD.
- For generators:
  - Upstream costs are ignored for generators in the determination of the connection charge, but taken into account when calculating the ETG (refer to paragraph 3.12.2). No costs will be allocated on upstream costs, but pro-rating of dedicated costs may be applicable.
  - Where previous generators or loads have been charged a pro-rata share on assets considered dedicated, any new generator must be also allocated a pro-rated share of the asset using actual costs or in the unlikely event costs are not known SNC can be used as an alternative.

- Where a load has funded the cost of the network, a share will be raised to the generator and refunded to the load.
- No refunds of shared costs will be provided to generators (refer to paragraph 3.14.2).

Equation 5: Allocation of actual cost for urban loads and generators when sharing is applicable

Capacity required kVA/kW ÷ total capacity kVA or kW
x Actual cost of total capacity kVA or kW[1]
= R/kVA/ or R/kW cost of share allocated to the customer

[1]Total capacity means the total installed capacity that can be shared by all customers at the point in the network where the supply is situated.

The share due to increased capacity is based on the following formula:

Equation 6: Pro-rating of actual costs due to increased capacity for urban loads and generators when sharing is applicable

Additional capacity required kVA or kW ÷ total capacity kVA or kW
x Actual cost of total capacity kVA or kW[1]
= R/kVA or R/kW shared cost allocated to the customer

[1]Total capacity means the total installed capacity that can be shared by all customers at the point in the network where the supply is situated.

The full cost of the connection works is payable when due to the standardisation of equipment more capacity is available than what is required, and it is unlikely that the supply will be shared. The standardisation of equipment ensures the least life-cycle costs.

3.6.2 Sharing through the SNC (new and existing upstream infrastructure) for loads

For sharing of existing upstream infrastructure a R/kVA shared network charge (SNC) is allocated based on the NMD (or change in NMD if it is an upgrade or downgrade or where ADMD is specified) where actual costs are not known. A contribution to upstream costs is payable irrespective of whether or not actual upstream costs are incurred by Eskom. This charge is payable instead of pro-rated actual costs and is an annually revised national average charge based on the replacement costs of networks and also takes into account diversity of usage of the assets. SNC may also be applied to dedicated assets that are later shared where actual costs are not known – refer to paragraph 3.2.2.

This methodology ensures that all loads contribute fairly to upstream costs. The SNC is allocated on the supply size required at a R/KVA value based on replacement cost and taking into account diversity. No individual customer receiving a new supply is therefore unfairly penalised by the timing of the investment taking place. Any costs incurred by Eskom, that are not recovered from the initial customers who caused the investment to be undertaken, are pooled into the rate base and over time are recovered from subsequent new customers when they take supply from an already strengthened network.

The SNC charge therefore ensures that all customers that require additional capacity make a contribution towards upstream networks, irrespective of whether or not new investment is required.

The SNC is used to allocate upstream costs (or previously dedicated costs) in addition to or in place of any actual (may be pro-rated) costs. The rules applicable to SNC are:

- Refer to paragraph 3.2.2 to determine whether sharing of costs is applicable or not.
- SNC is to be used instead of pro-rated actual costs:
  - Where actual costs are not known or
  - Where actual costs are known but the customer takes less than 10% of the new capacity installed in which case apply the greater of SNC or pro-rated actual costs (if known) based on NMD/installed capacity.
  - Refer also to section 3.6.1.
- SNC values will be calculated at replacement cost and will consider diversity of usage of assets.
- The SNC values depend on the voltage of the supply.

- A customer cannot be charged SNC and actual costs for the same part of the installation, i.e. if a network from a substation is totally new the customer will only pay actual costs (pro-rated or full) and not SNC for that part of the installation.
- SNC is charged on the NMD (except for Transflex – refer to paragraph 3.6.4) and not on installed capacity.
- Installed capacity only refers to equipment used directly by the customer.
- An early termination guarantee is not payable on the SNC portion of the connection charge. Refer to paragraph 3.12.2.

3.6.3 Allocation of costs for an upgrade or augmentation at the same voltage as the supply/connection

Work involving the upgrade or augmentation at the same voltage as the supply is not considered upstream assets. The new investment is considered to be for new network creation for the customer and is to be allocated (on a pro-rated basis where applicable) directly to the customer.

The cost of work for loads done at voltages higher than the primary side of the supply being taken is generally either recovered as a SNC or through the tariff (capital allowance), i.e. it is not allocated to the customer. For generators this cost is not allocated as a connection charge.

3.6.4 Allocation of upstream costs for Transflex tariffs

As described in the previous sections upstream sharing is typically based on the NMD. However, for Transflex quotations the upstream sharing will be based on the expected coincidence of the simultaneous maximum demand (SMD) against the NMD of the substations situated along the railway route linked to a specific Distribution substation or MTS and not the NMD alone.

The coincidence factor is used instead of the NMD for the following reasons:

- The demand on network infrastructure is not static as the demand moves as the trains travel through the different traction substations.
- This means that the substations experience the maximum demand only for a few minutes at a time.
- Upstream infrastructure would be built to accommodate the SMD and not the NMD.
- The demand therefore used to pro-rate actual costs or to allocate SNC should be the SMD and not the NMD.

The rules applicable for sharing of Transflex connections are:

- The customer will pay actual costs for all dedicated equipment associated with an upgrade of their supply requirements.
- SNC or pro-rated actual costs as the case may be will be calculated using the NMD of the new point of supply x (SMD/ sum of NMDs) connected to the same Distribution substation along the railway route in question.
- Contractually the stated NMDs will remain as the installed capacity at each of the substations and the capital allowance will be based on the NMD (as the tariff charges are based on the NMD). See also Appendix 2 (paragraph 1.2.3).

3.6.5 Sharing methodology for connection charges on rural overhead networks

The rules for sharing of rural costs are:

- Rural networks are considered dedicated unless otherwise known to be shared.
- The customer pays for the dedicated line costs and when a subsequent customer takes supply, any common line between the customers is shared not using capacity, but using distance and original (NAP) cost and the connection charge of the original supply is reduced/refunded
- SNC is payable for sharing of upstream substations and HV line costs for supplies > 100 kVA.

Sharing of line costs will be applied where 2 or more customers request a connection at the same time and there is common line. It may also occur when a customer has paid a connection charge for a dedicated portion of line and that line is later shared, then the first customer is entitled to a refund. This section deals with sharing of rural lines.

For supplies quoted in terms of this document, sharing of line costs will generally be applied as follows:

- Mandatory sharing after connection of the original customer. This is a Distribution Code requirement.
- It must always be established before quoting for a new rural supply if the supply is being connected off a line that has been paid by another customer.
- The sharing methodology for rural lines is described below.

The methodology is as follows:

- The line common between customers is shared based on distance not capacity
- Sharing is applied AFTER the line allowance is given, per customer. The line allowance is always subtracted before calculating the share, even for subsequent run-of-line points. This means all customers must receive their full line allowance distance due to them when sharing is being calculated.
- The connection charge for the original customer(s) is reduced by the share of the network now allocated to new customer(s). The connection charge will be refunded to the original customer if paid upfront or reduced if the MCC is still applicable.

3.6.5.1 Sharing for Landlight 20A supplies

Landlight 20A supplies typically share costs divided by the actual or potential number of customers sharing the connection plus any upstream sharing of the MV line. Refer further to 3.8.2.

3.6.5.2 Sharing of voltage regulators and other equipment installed on rural MV networks

Where voltage regulators or other equipment is installed to boost MV networks due to the provision of additional capacity for a supply, the following applies:

- If the additional capacity required is equal to or greater than 25% of the technical capacity at the point in the network where the supply is required, then the customer will pay the costs to install such equipment.
- If the capacity made available is more than is required and is likely to be shared by other customers, then the cost must be pro-rated.

3.6.5.3 Sharing when farm dwellers houses/electrification projects are connected on networks where connection charges have been paid or are paid monthly

Where a new point of supply is required for the electrification of farm dweller houses, sharing of line costs could be set aside if the share costs of the network are very high and consent is obtained from the existing customers whose monthly connection charge or upfront connection charge could be affected.

Where electrification projects are connected from a line where a monthly connection charge is paid, the monthly charge must be reduced for the original customer. Where the connection charge was paid up front, a refund must be given to the customer whose line is being shared. The NPV of the reduced charge is to be added to the electrification project's costs. Once reduced then the ROI can be re-calculated and the electrification project quoted.

3.6.6 Sharing of costs for switching stations

If the technical solution includes a switching station the following methodology will apply:

- The switching station should be seen as a MV or HV network and not as an upstream Distribution substation.
- Where there is an existing switching station, the MV or HV SNC will cover the costs.
- For a new or upgraded switching station actual costs (pro-rated if applicable), are payable.
- If actual costs are pro-rated they must be pro-rated on the number of feeders.
- If an upgrade of a switching station takes place then the costs must be pro-rated based on the number of additional feeders.

3.7 Costs used to determine connection charges

The following costs (which may be pro-rated) must be taken into account when calculating the connection charge. Note that IDC is not applicable as customers pay the connection charge upfront, refer to paragraph 3.11.

3.7.1 Actual material, labour and transport costs

The cost of all material, labour and transport and other associated costs to be spent in performing the required task (survey, construction, etc.). These costs will be determined in accordance with Eskom's standard engineering practice.

3.7.2 Engineering costs

The project specific engineering costs relating to engineering services such as design or design approval.

3.7.3 Survey

All costs relating to surveying a new point of supply, including environmental approvals and servitudes must be charged as a connection charge.

3.7.4 Overheads

Overheads to be added as a percentage of all allocated actual costs. The overhead percentage for all quotes to be used in all cases is the national average overhead quotation rate. There is no need to add overheads to SNC or NAP costs as these already include overheads.

3.7.5 Contingency

Contingency costs are determined by Engineering and are added to actual costs where applicable.

3.7.6 National average prices (NAP)

The rules for the NAP are:

- NAP are used in place of actual costs for rural projects falling within the minor works process.
- The NAP values are obtained annually, based on planned Distribution project costs for the next financial year.
- The line allowance and the transformer allowance is based on NAP values.
- For the transformer allowance $\leq$ 1 MVA, the NAP value is based on the cost of the transformer and > 1 MVA based on a R/kVA NAP value.
- Line costs for rural projects falling within the Major process will not be quoted using NAP and actual costs are used. The standard R value of the capital allowance for the line will apply.
- Overheads are not be added for any quotes using NAP.
- Escalation must be added to the NAP cost as per paragraph 3.7.8.
- For customer self-built schemes, the NAP for line and transformers will be used to calculate customer refunds, based on the capital allowance – refer also to paragraph 3.8.8.1.

3.7.7 Material credits

When changes are made to an electrical installation and equipment is removed and credited to the stores (if it is recoverable), then this credit must be passed onto the customer. Credits received must be allocated to the project cost.

3.7.8 Escalation

Escalation is to be added to NAP, the capital allowance, SNC and project costs. If the project costs provided exclude escalation, escalation must be added. If escalation is provided on the estimated project costs, then the values including escalation should be used and escalation should not be added again. It is important not to double count escalation to ensure that escalation is only applied once. Escalation, if not provided on the estimated project costs is calculated as follows:

Equation 7: Calculation of escalation

Cost x escalation % x (number of months until date of connection less number of months left in the current financial year) ÷12

3.8 Calculation of the connection charge for standard supplies- generators and loads

This section combines all the factors that have been previously set out to be able to allocate the costs and calculate the connection charges.

3.8.1 Calculation of connection charges: Landrate, Landlight 60A, Nightsave Rural and Ruraflex

Costs are allocated for the rural tariffs based on dedicated costs and/or shared costs (SNC or pro-rated actual) less capital allowance at the NAP for minor works and actual costs for major works. Refer to paragraph 3.6.5 on how sharing is applied. The formula to be applied is as follows:

Equation 8: Calculation of Landrate, Landlight 60A, Nightsave Rural and Ruraflex connection charge

Standard connection
(Total line length or cost[1] – capital allowance (distance-based or R/value method and cannot be less than zero)[2]
- Transformer allowance (full transformer cost for minor works and for major works actual costs less R/kVA value)[3]
+ If > 100 kVA
Pro-rata share or SNC of HV substation
Pro-rata share or SNC of HV line
+ Overheads on actual costs (not on SNC or NAP)
= Subtotal
+ Escalation on all of the above (refer to 3.7.8) if applicable [4]
+ If applicable sharing of common MV line[5]
+ Connection fee
= Standard connection charge
Premium connection
+ Premium connection costs
+ Overheads on premium connection costs
+ Escalation on premium connection costs (refer to 3.7.8) if applicable [4]
= Premium connection charge
= Standard connection charge + premium connection charge = Connection charge estimate
- CEL fee already paid if applicable
- BQ fee already paid if applicable
= Outstanding connection charge estimate

[1] NAP or actual costs. Actual costs applicable for major works projects.
[2] Line allowance may differ based on tariff and/or phase of supply. Refer to Appendix 1: Capital allowance for more information regarding capital allowances.
[3] Where a CT/VT is installed the cost will be rebated in full, the same as the transformer bank allowance, except if the cost is more expensive than the equivalent size of transformer bank. An additional amount for CT/VT units may be payable by the customer.
[4] If escalation is included in actual costs then escalation is not to be added again on actual costs
[5] Refer to 3.6.5.

3.8.2 Calculation of connection charge: Landlight 20A

Landlight 20A is a tariff that caters for rural supplies that require a single-phase electricity supply at 20A and typically where customers share transformers. The tariff is targeted at customers using electricity mainly for residential purposes or small-scale farming. Landlight 20A capital allowance is based on ¼ of the cost of the Landrate 4 line allowance and ¼ of the Landrate 4 transformer allowance. Refer to Appendix 1: Capital allowance for more information regarding capital allowances.

When quoting Landlight 20A customers, the following must be considered:

- The number of new customers (or potential) sharing the line and transformer, this refers to both MV and LV.
- Where there is an existing Landrate or Landlight 60A customer, no new transformers will be necessary to connect the new customer(s). Refer to paragraph 3.6.5.1.
- Where there is an existing customer with a monthly connection charge (MCC), the line sharing contribution per customer will be applicable. Refer to paragraph 3.6.5.
- Each individual customer's line distance for both MV and LV are shared between the customers sharing the line (or the potential customers).
- Whether the customer requires underground or overhead LV network.

The equation for calculating the Landlight 20A connection charge is as follows:

Equation 9: Calculation of Landlight 20A connection charge

Total line length ÷ customers sharing = Line allocated per customer
≥ 4 sharing
Less line allowance for single phase ÷ number of customers sharing
+ Transformer bank NAP costs ÷ number of customers = fully rebated
< 4 sharing
Less line allowance ÷ 4
+ Transformer bank NAP cost ÷ 4 x number of customers sharing
+ (LV line - LV line allowance) x NAP R/m cost
+ If applicable sharing of common network
+ Connection fee
= Connection charge

When quoting new Landlight 20A supplies sharing the transformer and line, the following will apply:

- Transformer
  - Where 4 or more customers share a transformer the costs of the transformer bank is fully rebated.
  - Where less than 4 customers share a transformer, deduct the transformer bank NAP cost ÷ 4 for each of the customers sharing the transformer and apportion the remaining cost to the number of customers.

- Line
  - Divide the line distance by the number of customers.
  - Where 4 or more customers share the line, deduct the single-phase line allowance / number of customers sharing the line. Where less than 4 customers share the line, deduct the single-phase line allowance distance ÷ 4.

3.8.3 Calculation of a connection charge - upgrade rule for voltage regulators and other equipment installed on rural MV networks

Where voltage regulators or other equipment is installed to boost MV networks due to the provision of additional capacity for a supply, the following rule applies:

- If the additional capacity required is equal to or greater than 25% of the technical capacity at the point in the network where the supply is required, then the customer will pay the costs to install such equipment. If the capacity made available is more than is required and is likely to be shared by other customers, then the cost must be pro-rated.

3.8.4 Calculation of a connection charge for Homelight, Homepower (single-phase and three-phase) and Businessrate single-phase

The connection charge for Homelight, Homepower and Businessrate 4 single phase supplies will depend on whether:

- If it is a single or three-phase supply.
- Eskom supplies the service connection or not and if so the service connection length.
- Underground cable or overhead line is installed.
- The supply is from a dedicated LV network or not.

Additional costs should be charged in addition to the connection fee where:

- the service connection length exceeds the LV line allowance for underground cable or overhead conductor, and
- MV line/cable has to be installed dedicated to one customer, and
- Transformation assets are dedicated to one customer or to a limited number of customers.

The connection charge for residential customers is based on the following two formulae:

Equation 10: Calculation of standard connection charge Homepower/Homelight/Businessrate single phase

Standard connection fees[1] where the cable or line of the service connection is within the LV service connection allowance and the transformer is shared, and where the service connection distance is greater than the LV service connection allowance use the following formula:
Connection charge = Standard connection fee + (Total service connection distance (m) – LV service connection allowance (m)) x standard NAP cost for LV cable/ line.
If a dedicated transformer is installed, then the amount payable will be the greater of allocated costs (dedicated transformer plus service cable plus SNC) or the connection fee.

[1]The standard connection fee will differ depending on what LV equipment Eskom is required to install.

Equation 11: Calculation of standard connection charge Homepower three-phase

HV SNC
+ MV SNC (upstream) and/or actual cost (dedicated or pro-rated)
+ LV SNC or actual costs– if coming off exiting LV reticulation network
+ Service cable (NAP for standard and actual for non-standard cable)
+ Meter (NAP)
+ Overheads on actual cost (refer to 3.7.4)
+ Escalation[1] on all of the above* (refer to 3.7.8)
= Total allocated costs
= Connection charge = greater of total allocated costs or connection fee.
[1] Escalation would only apply to change of financial year

3.8.5 Calculation of connection charge for Businessrate three-phase and Public Lighting

The following formula will apply to three-phase supplies:

Equation 12: Calculation of standard connection charge Businessrate three-phase and public lighting

SNC on a R/kVA basis
AND/OR where applicable
+ Actual costs pro-rated on a R/kVA or total when dedicated
+ Overheads on actual cost (refer to 3.7.4)
- Capital allowance [1]
+ Escalation on all of the above[2] (refer to 3.7.8)
= Total estimated connection charge or connection fee, whichever is the greater
If connection charge less than minimum standard connection fee, minimum standard connection fee applies
[1]The capital allowance for public lighting supplies given on network costs only – not on the lighting infrastructure.

[2] Escalation would only apply to change of financial year

3.8.6 Calculation of connection charges: urban standard supplies (loads)

The connection charge for an urban standard supply is an estimate of the connection charge at the time of quoting based on the accuracy level of the quote. The final connection charge may be amended for major works on the finalisation of the quote (refer to paragraph 3.20 for the accuracy level of quotes and paragraph 3.20.3 for how the charge is to be calculated). The connection charge for urban supplies is based on the following formula:

Equation 13: Calculation of standard connection charge urban: load

Transmission connection charge as quoted by Transmission
Transmission allocated standard connection costs inclusive of pro-rata sharing and transformation capacity charge, scope definition costs, overheads and escalation[3]
a) = Estimated Transmission standard connection charge
Transmission allocated premium connection costs inclusive of pro-rate sharing, scope definition costs, overheads and escalation[3]
b) = Estimated Transmission premium connection charge
Distribution standard connection charge
SNC on a R/kVA basis;
AND/OR where applicable
+ Actual costs[1] pro-rated on a R/kVA basis or total when dedicated including CEL costs and BQ fee costs[2]
+ Overheads on actual cost (refer to 3.7.4)
- Capital allowance (if applicable) on Distribution costs only
=Sub-total (cannot be less than zero)
+ Escalation on sub-total (refer to 3.7.8) [3]
c) = Estimated Distribution standard connection charge
Distribution premium connection charge
+ Premium connection costs
+ Overheads on premium connection costs
+ Escalation on premium connection costs [3]
d) = Estimated Distribution premium connection charge
Monopoly works
Cost of Monopoly works
+ Overheads on monopoly works costs[3]
+ Escalation on monopoly works connection costs[3]
e) = Monopoly works costs
a+b+c+d+e = Total connection charge estimate or connection fee[4], whichever is the greater
- CEL fee already paid
- BQ fee already paid
- Transmission scope definition fee already paid
= Balance of estimated connection charge still payable

[1]Metering is ignored for the purposes of the connection charge but included in the ETG calculation if applicable.
[2]CEL costs and BQ fee costs to be included in the project costs used to produce the budget quote.
[3]If escalation is added to any actual costs do not add escalation again on actual costs. For Transmission costs escalation and overheads are included in the costs and must not be added again. Escalation will apply to SNC and the capital allowance
[4]If connection charge less than minimum standard connection fee, minimum standard connection fee applies.

3.8.7 Calculation of connection charge for embedded generators

The rules applicable to embedded generators are:

- Generators will pay for all dedicated costs, but are not required to contribute towards any upstream costs. However a generator will be required to contribute towards a dedicated assets costs whether existing or new (a dedicated asset's cost is allocatable to one customer or a group of customers(
- There is no capital allowance on connection charges for generator connections.
- All new dedicated assets created are to be treated as if the customer is the only customer applying for the connection. Where the original customer was a generator who has paid the connection charge upfront and no sharing was been applied, a share will be raised to the subsequent generator or load. In line with the **Transmission Connection Charge Guideline**, this refund will not be provided to the first generator but will be retained by Distribution.

The costs allocated for a standard supply are based on the following formula:

Equation 14: Calculation of connection charge for an embedded generator

See

Equation 13: Calculation of standard connection charge, but with no capital allowance applied

3.8.7.1 Calculation of the connection charge for an embedded generator and a load at the same point of supply

Where the customer is both a generator and a load at the same point of supply, the connection costs are allocated as follows:

Equation 15: Calculation of standard connection charge for both a generator and a load

Type of cost	Load	Generator
SNC or pro-rated costs	✓	✓
+ Metering	N/a	N/a
+ Dedicated costs (can be pro-rated)	✓	✓
- Capital allowance	✓	N/a
= Connection charge - sum of above	Higher of the load connection charge or generator connection charge	
ETG - different methodology for the load and the generator	Refer to 3.12.2 for the calculation	

The following figure illustrates the connection scenario where there is consumption and generation at the same point of supply:

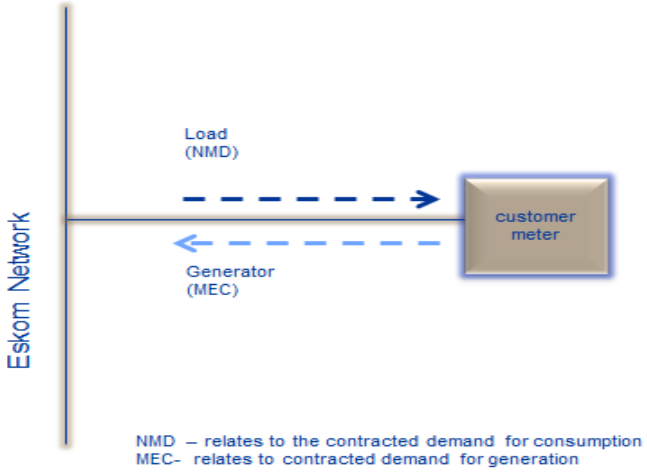


Figure 4: Connection scenario where there is consumption and generation at the same point of supply

Typically there is one four quadrant meter and the same network assets used for both generation and consumption of energy. The arrows in the picture depict the flow of energy through one meter and network assets.

3.8.7.2 Calculation of the connection charge for new load and new generator

The costs for the load and the generator will be determined at the time of quotation to determine the connection charge. If this occurs **at the same time**, the higher of the charge as a generator or as a load will be payable.

3.8.7.3 Calculation of the connection charge for existing load and new generator

Where there is an existing load and the customer installs a new generator at a later stage, the connection charge will be based on the following:

- Where there are no actual costs only the minimum connection charge (refer to paragraph 3.13.3) will be raised.
- Only actual costs will be payable or the minimum connection fee, whichever is the higher will be payable.

3.8.7.4 Calculation of the connection charge for new load and existing generator

Where there is an existing generator and the customer want a supply of electricity at the same connection point as the generator, the connection charge will be based on the following:

- If the load NMD is greater than the MEC of the generator, actual costs plus SNC and capital allowance are applied to the difference between the MEC and the NMD (assume a power factor of 1) is payable.
- If the load is less than the generator actual costs are to be applied, with no SNC and no capital allowance, or the minimum connection fee whichever is the higher.
- Where there are no actual costs only the minimum connection charge (refer to paragraph 3.13.3) will be raised.

3.8.7.5 Upgrade/downgrade of load and/or generator (one or both)

The principles outlined in paragraph 3.18 will be applied for upgrades or downgrades to either the generator and/or the load. All upgrades and downgrades will be referred to Engineering for analysis of the impact.

Where there is additional work required, the customer will pay for the incremental dedicated cost to make the connection available plus the applicable conversion fees for tariff conversion and change in supply size. Where there is no additional work to be done to accommodate the change, the customer will pay standard charges related to conversion fees plus the applicable conversion fees for tariff conversion and change in supply size.

3.8.8 Calculation of the connection charge for self-build projects

As required by the Codes Eskom shall allow self-build for the portion of work considered contestable subject to Eskom conditions contained in the **Self-build Procedures for MV/LV and for HV**. Self-build is not allowed on existing upstream infrastructure, but will be allowed on assets that are dedicated at the time of connection and may be shared in the future, provided the customer funds all the costs. Costs are also payable for the Eskom work required to be done on the contract works such as appointment of a clerk of works (COW) for inspection of the contract works – known as monopoly works.

The customer will hand over the self-build works to Eskom and a contract will be required to be signed between the customer and Eskom for the construction of the self-build works to be handed over to Eskom. Eskom reserves the right to not take over any works that are not constructed according to Eskom's latest approved technical standards.

Generators will not be refunded for any self-build connection costs if assets are later shared. For loads refunds will apply to the extent of the subsequent customer's share.

The customer will be required to provide the following Guarantees:

- The Contracts Works Security Guarantee (refer to paragraph 3.12.6),
- The Connection Charge Guarantee if a phased payment arrangement is allowed (refer to paragraph 3.12.1.)
- An ETG
- In addition for developers
    - The guarantee to protect Eskom against vandalism and theft (refer to paragraph 3.12.5).
    - An ETG will not be required as no capital allowance is provided to developers.

3.8.8.1 Rural MV/LV self-build

Refer to the Standard for MV/LV Self-Build Customer Projects in Distribution for the detailed process regarding customer self-build projects.

The connection charge rules applicable to rural self-build projects are:

- The customer will pay Eskom the portion of costs associated with the monopoly works (those works that only Eskom is allowed to do) as a connection charge. For rural supplies this is a set value based on 25% of the capital allowance.
- Customers will pay a connection charge for Eskom associated costs, typically the monopoly costs associated with the contract works, plus any Eskom dedicated work, plus the minimum connection charge plus if applicable SNC.
- Eskom will fund 75% of the capital allowance based on NAP. This refund is given only once the project is accepted by Eskom for handover.

The refund of the capital allowance must be calculated as follows:

Equation 16: Calculation of the capital allowance for self-build MV rural projects (load)

75% x (The NAP value of the transformer (transformer allowance) + the lesser of (The NAP value of the actual line length or the total line allowance or the actual self-build cost for the line allowance distance as per the phase of supply)

Equation 17: Calculation of the connection charge for self-build MV rural projects (load)

- 75% of R/value of rural line and transformer capital allowance (as per Equation 16)
+ 25% of capital allowance for monopoly works (works associated only with the self-build works)
+ Material provided by Eskom
+ SNC/pro-rated actual costs for upstream/shared assets based on capacity required
+ Escalation
+ Connection fee
= Estimated connection charge
If less than zero – to be refunded to customer after acceptable hand-over of assets

3.8.8.2 MV/LV Urban and HV self- build (non-developers)

Refer to the **Procedure for HV Self-build Projects 240-43874056** for the self-build process.

Self-build is only allowed on assets dedicated at the time of connection (no work on existing upstream assets allowed). If the asset is later shared no refunds will apply.

The customer will be required to pay a connection charge for the following.

- The actual costs of the monopoly work to be performed (the work required by Eskom on the contract works).
  - These will be provided through the quotation process (i.e. cost estimate and budget quotation) and will be based on estimated costs.
  - This cost is not capped – i.e. a final reconciliation of costs will be done upon the completion of the project and this will be based on the actual costs incurred. Any shortfall will be payable by the customer and any over-charging by Eskom will be refunded to the customer.
- Plus the portion of the dedicated Eskom works requested to be done by the customer (such as EIA's survey).
  - Including if the customer requests additional investment that exceeds that of a standard connection, then a premium connection charge will be payable for the additional investment.
  - This portion of costs is capped to the standard Eskom cost confidence accuracy levels and exemptions as set out in the quotation letter.
- Plus where applicable an allocated share of upstream costs based on:
  - Any work or capacity allocated to the customer on assets other than the dedicated assets. This cost may be recovered based on a pro-rata share of actual costs or an SNC.
  - Any dedicated costs arising from work required on the Eskom Transmission grid as a result of the connection of the customer will be passed through as a connection charge to the customer.
- Less where applicable the capital allowance (loads only).
  - The capital allowance shall only be applied to the portion of the connection works being done by Eskom including the upstream costs allocated and the monopoly works.
  - The capital allowance is only applied to the Eskom costs and not the customer self-build works.

For HV self-build projects the following equation applies to the calculation of the connection charge.

Equation 18: Calculation of the connection charge for self-build HV projects

Actual Eskom costs
+ Monopoly works (works associated only with the self-build works)
= Subtotal
+ Overheads
= Subtotal
+ SNC/pro-rated actual costs for upstream/shared assets based on capacity required
- Capital allowance
+ Escalation
= Connection charge (cannot be less than zero)
Or connection fee whichever is the greater

Self-build is allowed only for work on dedicated assets. As asset that may be shared in future but at the time of construction, is required to supply an individual or identified group of customers customer is treated as dedicated. No refunds will apply if the self-build asset is later shared, as this would require Eskom to take this refund through the procurement process (the refund would be based on the customer's cost). The customer has the choice to wait for Eskom to construct the asset.

3.8.8.3 Self-build for developers

- Developers are entities that undertake the required activities of developing a particular area. This could include rezoning land to a different zone and meeting all the requirements set by the local government.
- No bulk supplies may be provided to a development with freehold stands i.e. the developer will hand over the assets to Eskom and Eskom will be the supply authority to every stand.
  - The developer will be quoted for all incremental allocated project costs associated with the development. If the developer provides the connection works then the developer will be required to comply with the conditions of the Eskom HV or MV/LV Standards (as the case may be).

- Residential core developments, commercial and industrial developers will pay full dedicated costs plus SNC/pro-rated actual costs.
  - For residential 1 and 2 developments SNC is raised at time of quoting the developer.
  - For residential 3 commercial and industrial developments no SNC is raised at time of quoting the developer but is raised when the end-user applies to Eskom for supply.
- No capital allowances are provided directly to the developer, this will be provided to the end-use customer through rebating the connection charge through a lower connection fee.
- The end-use customer will not be charged for any costs already funded by the developer. See paragraph 3.13.

Equation 19: Calculation of connection charge for a development

Actual dedicated costs
+ SNC/pro-rated actual costs for upstream/shared assets based on capacity required
= Connection charge

- Eskom zonal standards which govern the minimum ADMD should be used as a guideline to determine the capacity required for the development. No developer should be allowed to request capacity less than the Eskom zonal standard applicable to the specific development.

3.8.8.4 Calculation of connection charge for electrification projects

Actual costs plus a contribution to actual upstream costs, i.e. no SNC or capital allowance is payable by the project. For individuals in the project only the connection fee is payable. All electrification projects are deemed urban.

3.8.8.5 Calculation of connection charge for residential subdivisions

- A subdivision is an existing property that is divided in such a way that access to all the sub-divided properties remains bordered on a public road and there are no internal roads or internal infrastructure being developed. In such a case new applications will be treated as a direct Eskom connection. For all other cases refer to developer projects, paragraph 3.8.8.3.
- Each subdivided portion of the original erf would need to have a separate registered title deed and an application for a connection.
- The owner/entity (developer) that is subdividing the property will be responsible for applying for the connection and paying the connection charges (as it is assumed these services will have to be provided as a condition of the sub-division).
- Each application will be treated as a new connection, enter into individual supply agreement(s) with Eskom and pay a connection charge.
- The original connection is ignored and not treated as an upgrade. The owner who is developing the property must apply for the connections to the subdivided erven in order to sell these erven as fully serviced properties.

3.8.9 Calculation of connection charge for load-to-load wheeling of energy; Eskom wheeling through customer networks

Where there is a load-to-load wheeling agreement between Eskom and an Eskom customer for the use of the customer network to transport energy to other Eskom customers, Eskom will fund the cost of the connection associated with the capacity that Eskom requires to supply its customers and the customer supplying the network will only be required to pay the difference, if any for own use, based on pro-rata sharing.

This will also apply in cases where changes in supply are required for the purposes of making the wheeling connection available (e.g. upgrade/ downgrade in supply).

3.8.10 Calculation of connection charge for Eskom supplies

Eskom points of supply are treated in the same manner as any other customer with the following exceptions:

- No guarantees (e.g. deposits for consumption or early termination) are payable.
- The connection charges, cost estimate fees and quotation fees payable are exempt from VAT.

- The quotation should therefore state "Not Applicable" for VAT and guarantees.
- Funding of the supply is provided by internal transfers between Eskom divisions, i.e. Distribution "pays" Transmission for connection and use of system charges.

3.9 Calculation of the connection charge for premium power supplies/assets - generators and loads

A premium connection is described in paragraph 3.2.4.2. The request for a premium power supply is usually associated with customers contracting for a supply that is above the least life-cycle cost, technically acceptable solution, (as is defined in the **Distribution Grid Code (Tariff Code and network investment criteria section of the Network Code)** such as:

a) The customer requests a supply that is above the least life-cycle cost option and then customer is required to pay for this additional cost as a premium connection charge. This could be to provide a greater reliability of supply than the Eskom standard e.g an N-1 supply where the standard would be to provide a single contingency).[1]
b) Where exclusive use equipment is required by the customer. It is not Eskom's policy to provide dedicated equipment for the exclusive use of the customer unless exceptional circumstances warrant such a supply. Where additional circuits are installed to mitigate quality of supply problems associated with polluting loads (assuming the customer causes the pollution).
c) Where special or non-standard metering equipment, such as HV metering for very small supplies or LV metering for very large supplies, is required.
d) Where underground circuits are required in areas where overhead would be the norm.
e) Where non-standard lines or transformers are requested e.g. extra high poles for game reserves. Here the additional **expenditure** (i.e. the difference in cost between the standard pole and the high pole) is classified as premium expenditure although the equipment is standard. This is also applicable to non-standard voltage transformers. The Rand value of the standard NAP capital allowances is given.
f) Deviation from standard designs e.g. where the Engineering design is to install a 20MVA transformer but the customer prefers 2 x 10MVA transformer to be installed. The difference in cost would be classified as premium expenditure even though the equipment will be classified as standard. If the Engineering design was to install 2 x 10MVA transformers then no expenditure will be classified as premium.

No contract may provide a "firm" supply as this implies a supply where the supply will not be interrupted for whatever reason. A premium supply is only one where the equipment installed provides a higher reliability of supply and not one that provides a firm supply.

Customers must be informed contractually of the nature of the premium supply, whether it is a clearly demarcated asset or associated with additional costs. The customer should always be made aware that at the time of refurbishment, Eskom is required to invest according to the rules in the **Distribution Code**. If the costs of refurbishment are in excess of what can be justified as standard supply, the customer is liable for these, irrespective of whether or not the supply at the time of connection is a standard or premium supply (refer to paragraph 3.10.4).

3.9.1 Premium assets vs premium conditions

A premium connection is not always associated with a clearly identified "asset". In some cases it may be an additional transformer or line to ensure greater reliability, but in other cases it could be non-standard equipment such as higher poles to accommodate giraffe on a game farm.

This means that in some cases the asset can be clearly identified and in other cases not. The rules applicable to allocating costs for premium supplies are:

- A deep connection charge approach is followed for premium supplies i.e. all additional incremental costs with a premium supply is allocated – both dedicated and upstream if applicable.
- All actual Transmission costs and Distribution costs (pro-rated where relevant) is to be used.

[1] Note that N-1 does not necessarily mean premium. It's possible that the least life-cycle cost option could be an N-1 technical solution and in such a case this would be a standard supply. The decision therefore as to what constitutes a standard supply, is a technical decision based on least life-cycle cost - and not pricing decision. Please note that Eskom does not contract for a firm supply only a premium supply.

- SNCs are not applicable for premium power supplies as additional "premium" capacity is not normally provided upstream and it is not associated with additional and does not generate additional revenue. However, if actual upstream capacity is reserved in excess of the NMD/MEC, actual pro-rata costs, if applicable must be allocated.
- If existing upstream capacity (in excess of the NMD) is reserved, SNC costs can be used as a proxy for upstream premium costs if a premium supply is required on upstream assets and the actual costs are not known.
- No capital allowance is applicable to premium connections.
- If a portion of a premium power supply becomes a standard supply through an increase in NMD, SNC will be applicable to the incremental demand and be subject to a capital allowance. See section on upgrades, paragraph 3.18.1.
- The refurbishment of premium connections is recovered through a new connection charge (refer to paragraph 3.10.4.)

3.9.2 Calculation of connection charge for upstream strengthening for premium power supplies

For premium power supplies, all associated costs including upstream costs are to be recovered through a connection charge.

For premium supplies, the customer needs to state the level at which upstream premium supply is required and will make an appropriate contribution for this requirement.

- SNCs are not applicable for premium power supplies as actual or pro-rated costs are payable and it is not associated with additional load or revenue. SNCs may however, be used as a proxy for pro-rated costs (see next section).
- Where investment is required to upgrade a network in order to cater for a premium power supply, the customer is required to pay these costs as an up-front payment.
- Costs may be pro-rated or not, depending on:
  - The percentage of the upgrade costs that can be allocated to the standard supply and to the premium supply; and/or
  - if there is additional capacity installed (over and above what is required) due to possible future growth or technical standards, i.e. the total additional capacity installed or upgrade is not due to solely for the requirements of the premium supply; and/or
  - if total additional capacity installed is higher than what is required due to standardisation of equipment, and it is unlikely that the additional capacity installed will be shared in future, no pro-rating is applicable i.e. the full cost is payable.

3.9.3 Premium supply converted to standard supply

A premium supply may be converted to a standard supply, partially or fully, when the customer's load has increased to the extent that the equipment that was previously defined as premium equipment has to be used to meet the customer's NMD/MEC and the customer no longer wishes to have a premium supply/equipment. . No rebate of an existing monthly PCC or refund of an upfront PCC will be given. SNC will not be applied to the share of asset in question.

Equation 20: Calculation of the connection charge when a premium supply is converted to a standard supply

No rebate/refund of any existing PCC already paid. If there is an existing monthly PCC this must be converted to a SCC for the remaining period (though the Electricity Supply Contract) and a new connection charge will raised as follows:
The greater of the conversion fee or
+ Actual cost
+ SNC for the additional capacity (not associated with the premium asset)
- Less the capital allowance based on the additional capacity
= Connection Charge

Eskom cannot use assets associated with a premium supply to supply the load of other customers. The premium equipment shall remain premium equipment where such equipment is moved from another POD with over-capacity to a POD of the same customer that has inadequate capacity in order to meet the increased standard load. The customer is required to pay all irrecoverable costs of moving this equipment. If premium equipment is moved to meet a customer additional load required then the equipment is no longer premium but standard. If it is moved to ensure a premium condition at a new site then it must remain premium equipment. See paragraph 3.23.

3.9.4 Connection charge where there is an increase in NMD/MEC and its impact on a premium supply

Where the customer's load has increased and the customer wishes to retain premium equipment, the increase in load will be catered for with the installation of additional standard equipment and quoted as standard connection. Actual costs, SNC and the capital allowance if applicable will now be charged as a connection charge for the additional NMD/MEC.

3.10 Maintenance and refurbishment costs

3.10.1 Maintenance of standard supplies

Maintenance costs of standard assets is covered by tariff charges. Where the customer is responsible for higher maintenance cost or more frequent maintenance of standard equipment, Eskom reserves the right to request the customer to make a contribution to the maintenance cost. For example, due to high pollution caused by the customer's works, Eskom equipment must be cleaned more frequently to prevent arcing. The customer may then be requested to make a contribution to the cost of maintenance.

3.10.2 Maintenance of premium supplies

Eskom reserves the right to raise a charge to the customer to maintain premium equipment where these costs can be easily identified and allocated to the specific assets as described in the above paragraph.

3.10.3 Refurbishment of standard supplies

In most circumstances, any costs associated with refurbishment of standard equipment required to meet the minimum quality of supply standards (**NRS 048)** are not charged directly to any customer as a connection charge.

The rules are:

- Refurbishment costs for standard assets/conditions are recovered through the tariff charges.
- A customer may not be charged refurbishment costs to bring a standard connection up to acceptable quality of supply standards as per NRS 048 or to meet the contractual NMD/MEC.
- An exception to this would be where the customer is the cause of the refurbishment to occur sooner than would have been the case under normal operating conditions. An example is a customer that continually exceeds the NMD or MEC causing overloading of the network assets.

3.10.4 Refurbishment of premium supplies

Eskom will refurbish when it becomes necessary when equipment needs to be refurbished or replaced for technical and safety reasons. Eskom will refurbish the Eskom equipment in accordance with the investment criteria set out in the Code. Due to advancements and technical improvements, unavailability of equipment and other technological changes, like for like replacement of the existing Eskom equipment as installed at the time of connection supplying the customer may not be possible.

If at the time of refurbishment the customer has requirements that cannot be met in terms of what is allowed by the Code as a standard supply, such additional equipment will be seen as premium equipment and the customer will be liable for any costs associated with the equipment needed to provide a premium supply. Therefore when refurbishment is required on connection assets that are considered premium assets, the customer must pay actual costs as a new premium connection charge for the premium power portion of the installed network equipment that is to be refurbished. If the customer is not willing to pay for this refurbishment, Eskom reserves the right to

disconnect such assets from the network should it be deemed that it poses a safety risk and the premium supply will be withdrawn and contracted accordingly.

This requirement must be included in the contract (standard clause), where the relevant terms and conditions will be included. See paragraph 3.2.4.2 for more information on premium power supplies.

It could be possible that a customer has an existing supply that was not specifically contracted for as a premium supply, but due to the way Eskom installed the networks at the time or due to the customer's configuration, there is spare capacity. This spare capacity would not be a reserve transformer (as per the previous paragraph), but could be capacity available spread over various transformers. When the supply is to be refurbished the least cost option would be for Eskom to replace the many transformers with say one or two larger standard size transformers. However, due to the customer's installation, this may not be a technically acceptable solution for the customer.

In such a scenario the following guidelines are to be applied:

a) Eskom must first identify any spare or reserve transformers. These will be considered premium assets and the customer will be required to pay for any replacement of the asset. Should the customer want to retain these assets then these assets will be classified as premium and the customer would have to pay for that at the replacement value of the assets.
b) Eskom also reserves the right to remove any unsafe equipment that will not be refurbished.
c) Where there is spare capacity, but not spare transformers, Eskom must discuss with the customer the least-cost option and evaluate the cost to be incurred by the customer to replace the existing configuration if the supply was refurbished using the least-cost technical option.
d) The least life-cycle cost option must be compared against the cost of providing the customer with a similar replacement to suit the customer's existing technical configuration.
e) If the cost to provide the customer with a similar replacement to suit the customer's existing technical configuration, is lower than or equal the least life-cycle cost then the customer should be provided with a similar replacement of existing assets as a standard supply.
f) If the least life-cycle cost option is lower than the cost to provide the customer with a similar replacement to suit the customer's existing technical configuration then only the least life-cycle cost technical option will be justified as the standard supply. The customer will be required to pay a premium connection charge for any costs in excess of the least life-cycle cost option.

Refer also to Appendix 2: Technical considerations for historically above standard supplies (HASS)

3.11 Payment of connection charges

3.11.1 Financing of connection charges

Financing of connection charges was provided by Eskom prior to April 2009. Eskom no longer provides financing of connection charges to customers, except for municipalities in terms of the **Phased Payment of Connection Charges for Municipalities Policy.**

3.11.2 Upfront payment of connection charges

Connection charges are payable up-front before Eskom will commence with the connection works. Eskom may allow phased payments, see next section.

3.11.3 Phased payment of upfront connection charges

Eskom may on request, and subject to negotiation, allow payment of the connection charge to be made in phases before connection takes place subject to the following rules:

- Phased payments are only allowed for major works projects due to the time taken to construct such projects
- The phased payment schedule will be determined by Eskom.
- A phased payment schedule must be based on logical periods such as work progress stages or fixed periods. A phased payment schedule should not be used as an interim financing mechanism for the customer.
- In the event of an approved phased payment schedule, this will be conditional on the provision of a connection charge guarantee (see Section 3.12) to cover the outstanding connection charge payments.

- If the payments aren't made in accordance with the payment schedule, then Eskom reserves the right to call upon the guarantee and/or halt the project until the payments have been made.
- Under no circumstances may work proceed to the next phase until the required connection charge for that phase is paid in full, failing which Eskom could opt to draw on the connection charge guarantee or halt the project.
- The connection will not be commissioned until all payments have been made and all the relevant contracts have been signed.
- Where phased payments are allowed the minimum contribution payable up front at time of accepting the quotation is the first phase of the instalment or 25% whichever is the higher.
- The phasing must be included in the submission to the investment committee for their information.

3.12 Guarantees

3.12.1 Connection charge guarantee

This is a guarantee to cover the risk of not recovering costs not paid upfront by the customer where a payment schedule has been allowed.

The rules for the connection charge guarantee are:

- Where a payment schedule is agreed to, the customer will be required to pay the allowed minimum upfront payment (see Equation 21) and give a connection charge guarantee for the remainder of the connection charge which will reduce for each progress payment, before the next project phase will commence.
- The connection charge guarantee must cover the full outstanding connection charge, excluding any SNC payable on existing assets. No guarantee is required on the SNC contribution as Eskom is at no risk.

Equation 21: Minimum upfront payment required for a phased payment arrangement (load)

The greater of 25% of the estimated outstanding connection charge or the value of SNC in the estimated connection charge

Equation 22: Minimum upfront payment required for a phased payment arrangement (generator)

The 25% of the estimated outstanding connection charge

Equation 23: Calculation of the connection charge guarantee amount

Total connection charge less the minimum upfront payment = outstanding connection charge

3.12.2 Early termination guarantee

In addition to the connection charge an early termination guarantee (ETG) is required to cover any actual costs not included in the connection charge in the event of early termination by the customer (i.e. financed at the time by Eskom). Not all of Eskom's costs may be covered by the connection charge, such as in the case of loads the capital allowance or in the case of generators the upstream costs. An ETG is required to mitigate the risk of the customer base having to pay for stranded asset in the event of early termination by a customer. The following rules apply to the ETG:

- The ETG is raised for all major works projects, rural and urban, generators and loads. For minor works projects refer to Section 3.37 dealing with the notice period.
- An ETG is not required for a premium supply as all cost are payable upfront.
- The guarantee amount will reduce over time. i.e. the amount will decrease in equal amounts by 1/10th (one tenth) per year, starting at the end of the 4th year after the supply is made available and will be completely extinguished after 13 (thirteen) years.

- Where the supply is terminated before the thirteen year period has lapsed, Eskom shall be entitled to call up the outstanding amount of the guarantee at that point in time without any notice to the customer. For example, if the supply is terminated after 6 years, then Eskom can only claim 80% of the original value of the guarantee. Such amount shall be refunded if the supply is taken over by another customer within 6 months after the termination of the contract by the customer has taken place.
- Where a transfer of supply takes place, the customer taking over the supply must provide an ETG equivalent to the value of the outstanding ICG/ETG amount at the time of the transfer.
- An ETG is not required on any supply changes such as upgrades or downgrades where there is no actual work done by Eskom.
- An irrecoverable costs guarantee will no longer be required for new connections (replaced by the ETG) but will remain in place for existing supplies where these guarantees have been provided in the past.

3.12.3 Early termination guarantee for loads

The ETG is the amount by which any actual costs are reduced by the capital allowance and as a result are not paid by the customer in the connection charge. The ETG is not applicable to any portion of the SNC reduced by the capital allowance.

The formula is as follows:

Equation 24: Calculation of the ETG for a load

a) 100% metering costs (including overheads and escalation) + VAT
+
b) The lesser of
Actual costs (including overheads and escalation) +VAT
Or
The capital allowance less SNC +VAT
Total ETG = a) + b)

3.12.4 Early termination guarantee for generators

- For generators the ETG will in most cases be based on any actual costs not recovered through the connection charge plus the cost of the meter. Actual upstream costs may be pro-rated if sharing by other customers is likely.
- The ETG will be 50% of the actual upstream costs not allocated to the connection charge plus 100% of the metering costs.
- Where the dedicated costs have or will be been shared by other customers or a portion for Eskom purposes, the ETG must be pro-rated based on the customer's capacity over the total capacity installed. This is applicable to the original customer and any subsequent customers. However, once more than 50% of the upstream costs is allocated, then the ETGs of all customers that have provided ETGs must be reduced to exclude the upstream costs (ETG for metering may still be applicable).
- An ETG is not payable where upstream investment has already been committed for growth in an area and the customer connection is not causing any incremental costs to be incurred.

Equation 25: Calculation of the ETG for a generator

Upstream actual connection costs (including overheads and escalation x 50%) not recovered in the connection charge
x If applicable pro-rated based on required capacity/total installed capacity
+ Full metering costs

- Where the customer is both a generator and a load determine whether the generator connection charge is to be allocated or the load connection charge is to be allocated and apply the ETG applicable to that connection charge (refer to paragraph 3.8.7 for more details).

Equation 26: Calculation of the ETG for a generator and a load at the same point of supply

If generator connection charge applicable, ETG is based on the calculation of an ETG for a generator (refer to Equation 25)
If load connection charge applicable, ETG is based on the calculation of an ETG for a load (refer to Equation 24)

3.12.4.1 ETG for municipalities

Municipalities, due to it being unlikely that the supply will be terminated, may be exempted from providing an ETG under the following conditions:

- Where the risk of early termination by the customer is perceived to be low.
- Where they are in good financial standing with Eskom.
- The supply must not be required solely because of an individual customer beyond the municipal meter.
- The exemption applicable to municipalities to provide an ETG may be revoked at any time should the municipality default on payment of its electricity account.

3.12.5 Guarantee to be provided by Developers against vandalism and theft

In addition to the guarantee required to protect against defective work (The Contract Works Security) if the development is a self-build project, the developer will be required to provide a guarantee against vandalism and theft. These types of developments are considered to be a fairly high risk to Eskom as full occupation does not always occur immediately but often over the medium term. The developer must provide a bank guarantee to Eskom which must remain in full force and effect for (i) 3 months after the expiry of the Defects Liability Period or (ii) until 50% of the stands in each phase (should the infrastructure allow) of the development have become occupied, whichever is the later. The value of the guarantee should be calculated as at least 10% of the Eskom cost of replacing the electrical infrastructure installed by the developer. This percentage of 10% is a guideline and Regional discretion should be exercised.

In assessing the value of any guarantee required, consideration should be given to the difference in risk associated with overhead aluminium conductor (lower risk) versus underground copper cable (higher risk).

As an alternative to a guarantee being provided by the developer, the provision of security services or insurance cover at the developer's expense could be considered for the 24 month period or until 50% of the stands have become occupied.

3.12.6 Contract Works Security for self-build projects

This guarantee is payable by the customer/developer for any self-build project. The guarantee amount is based on 10% of the estimated value of the Contract Works. The customer/developer will be required to provide this estimate.

3.13 Standard connection fees

The connection fee is a minimum connection charge covering a standard average cost of connection. This fee is payable in addition to allocated costs for rural tariffs or for urban tariffs if the actual costs are lower than the connection fee.

3.13.1 Standard connection fees / charges – residential tariffs Homelight and Homepower

For residential tariffs, the connection fee is the minimum set connection charge payable for specific work to be done. Work in excess of what is covered by the connection fee, will be payable by the customer as part of the total connection charge.

The connection fees for a basic connection (refer to paragraph 3.8.4 will cover the full connection costs for standard service cable allowances. Residential connection fees are differentiated based on:

- Phase of supply
- Electrification or non-electrification
- Funding of infrastructure by Developers
- Type of MV connection (overhead or underground)
- Type of LV connection (overhead or underground)

3.13.2 Connection fee – Businessrate

Single-phase Businessrate supplies will pay only the standard set connection fee for connections made where no additional MV or LV work is required and the service connection cable length is within a specified distance for underground cable or for overhead LV conductor.

The greater of full allocated connection costs or a minimum set connection fee is payable up front for Businessrate three-phase supplies. Refer to paragraph 3.8.5.

3.13.3 Connection fee – LPU tariffs and generator minor-works projects

Full allocated costs or the minimum set connection fee, whichever is the higher are payable upfront (refer to paragraph 3.8.6).

3.13.4 Connection fees for rural supplies

3.13.4.1 Connection fee for Landrate, Landlight 60A, Ruraflex and Nightsave Rural

- For rural supplies < 1 MVA, a set minimum connection fee is payable based on a percentage of the capital allowance given. This percentage will be approved by the GCS Pricing Committee.
- For rural supplies > 1 MVA the connection fee is calculated as a percentage of the actual transformer costs and a percentage of the line capital allowance.
- The connection fee for supplies where CT/VT units are installed will be calculated as a percentage of the installed cost of the CT/VT unit and a percentage of the line capital allowance.
- As rural tariffs are subsidised, the connection fee is not subtracted from the allocated costs.
- Any costs exceeding the capital allowance are payable in addition to the minimum connection fee as a connection charge.

3.13.4.2 Connection fee for Landlight 20A supplies

- The Landlight 20A connection fee for 20A supplies is equal to the Homelight 60A connection as determined by Nersa.
- The connection fee for Landlight 20A is not subtracted from the allocated costs and is treated in the same manner as for all other rural supplies.
- Refer to paragraph 3.8.2.

3.14 Refunds for sharing

3.14.1 Refunds for loads due to sharing

Where the original customer has paid the connection charge up front the customer that shares the network will also be required to pay up front for the calculated share. A fair share is raised from the second customer as an upfront contribution and paid to the first customer. Note this is a different issue to any refunds that may occur due to an Eskom customer receiving a pay-back where the capital allowance or upstream costs are funded by the customer (see paragraph 3.3).

3.14.2 Refunds for generators due to sharing

Where the original customer was a generator who has paid the connection charge upfront and no sharing was been applied, a share will be raised to the subsequent generator or load. In line with the **Transmission connection charge Guideline**, this refund will not be provided to the first generator but will be retained by Distribution.

This is to ensure no windfall benefits are given to generators that are already being paid through their PPA the cost of the network funded through the connection charge.

3.15 Conversion fees

Conversion fees are the minimum amount payable for tariff changes, upgrades or downgrades in supply size, meter changes, change in phase, changes in installation or when a supply point is shifted. These fees are important to provide the correct pricing signal related to costs incurred and to prevent tariff hopping.

Conversion fees are payable for the following:

- Change in meter type/meter
- Tariff changes
- Changes in supply size/NMD
- Changes of phase
- Shift in point of supply/line

Refer to the Standard Charges document on the www.eskom.co.za/tariffs website for charges and rules applicable to conversion fees.

3.16 Meter installation changes

The following will apply when a metering installation (meter, kiosk and other associated equipment with the meter) changes are required:

- Where meter changes are required (including reprogramming) due to a customer request not deemed to be a necessary Eskom replacement of the meter or due to a tariff change, the standard conversion charges as specified in the latest Standard charged document are payable.
- Except for reasons above, where the meter change is an Eskom requirement, for business reasons or to replace an existing metering installation to meet current standards, no charges are payable by the customer.
- Where a split metering installation has been installed and no meter change is required to change from a conventional meter reading to a prepayment meter mode, no meter change fee is payable. Other charges, however for the conversion, may apply.

3.17 Tariff conversions

It will not be allowed for customers to convert from one tariff to another more than once in a 12-month period unless circumstances warrant the conversion (see next paragraph). The supply agreement needs to include a clause that the customer may not change the tariff within a period of 12 months. The 12 months is not the liability period but a restriction on the amount of tariff conversions allowed within a year to prevent tariff-hopping to avoid seasonal charges, and therefore there may be a liability period applicable. If the tariff conversion coincides with an upgrade or a downgrade (refer to paragraph 3.18) a new liability period as applicable may apply.

If there are circumstances that warrant an allowable change of tariff within 12-months, such as a supply upgrade or genuine situations that are beyond a customer's control (e.g. force majeure, downscaling of operations, etc.) the contract conditions for converting to another tariff may be waived. The Operating Unit Pricing Managers are to approve any tariff conversions that are requested prior to the expiry of the contract period.

3.17.1 Rural tariff conversions

A tariff conversion fee is payable as per the standard charges tables. If the conversion coincides with an upgrade or a downgrade refer to paragraph 3.18.

Tariff conversions at the same supply size or an upgrade is allowed within the liability period. For an upgrade or downgrade with new work a new liability period is applicable.

The following charges are to be raised for tariff conversions:

3.17.1.1 Conversions from Landrate 1, 2 or 3 to Landrate 4/Landlight 60A/Landrate Dx

The following will be applicable:

- From 2001, Landrate 4 was only allowed as a 16 kVA single-phase supply for all new connections, due to the highly subsidised nature of the tariff. If the supply was connected (or quoted) prior to 1 January 2001 as a three-phase supply a tariff conversion to Landrate 4 will be allowed, provided that the NMD of the new supply is $\leq$ 25 kVA.
- If the supply was quoted after 1 January 2001, a conversion to Landrate 4 or Landlight 60A will only be allowed if the supply is converted to a single-phase supply at the customer's cost. No three-phase PODs will be able to be supplied from the POD/dedicated portion of line that has been downgraded to single-phase. This is to avoid customers requesting a tariff that allows a three-phase supply and at a later stage converting to Landrate 4 or Landlight 60A, at a considerable loss to Eskom as Landrate 4 or Landlight 60A is cheaper at lower consumption levels than Landrate 1.
- A tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.1.2 Conversions from Landrate 4 to Landlight 60A

The following will be applicable:

- The tariff conversion fee is payable.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering, unless such a change is part of a meter-change programme by Eskom,
- Plus any outstanding liability if within the first 60 months

3.17.1.3 Conversions from Landrate Dx to Landrate 1 or Landrate 4/Landlight 60A

The following will be applicable:

- The tariff conversion fee is payable.
- This is an upgrade in supply size – refer to paragraph 3.18.1.3.
- For a change of phase refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.1.4 Conversions from Landrate/Landlight 60A to Nightsave (Rural) or Ruraflex

The following will be applicable:

- The tariff conversion fee is payable.
- No SNC must be charged on conversions <100kVA even it's an upgrade. Where the conversion involves an upgrade to a demand in excess of 100kVA, SNC will be payable on that portion of the demand exceeding the 100kVA threshold.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.1.5 Conversions from Landrate/Landlight 60A to Landlight 20A

The following will be applicable:

- The tariff conversion fee is payable.
- The supply must be downgraded to the correct supply size and be converted to a prepayment meter.
- The change of phase fee is payable where applicable.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

- This conversion will on be allowed once the 60 months liability period is up, alternatively the customer can convert within this period provided the equivalent of the 16 kVA connection fee (due to the fact the customer received a bigger capital allowance on Landrate) is paid.
- Where the customer converting does not have an MCC applicable, ignore line sharing.

3.17.1.6 Conversions from Nightsave (Rural) or Ruraflex to Landrate/Landlight 60A

The following will be applicable:

- .
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- Downgrades will only be allowed after the 60 months liability period.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.1.7 Conversions between Nightsave (Rural)/Ruraflex and Nightsave (Rural)/Ruraflex

The following will be applicable:

- SNC is not applicable for conversions <100kVA.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.1.8 Conversions from Homelight to Landrate, Landlight (20A and 60A), Ruraflex or Nightsave Rural

The following will be applicable:

- The conversion should only be requested where a school or a clinic in a low density area that was allowed to be on Homelight 20A or 60A (in terms of the **Schools and Clinics Policy**) needs to upgrade.
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.1.9 Conversions to/from Ruraflex Gen from/to Nightsave Rural or Ruraflex

The following will be applicable:

- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.1.10 Conversions to new rural tariffs (not listed at the time of drafting this document)

The following will be applicable:

- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.2 Urban tariff conversions

The following will be applicable:

- Conversions to/from Homelight or Homepower residential tariffs should be based on the ADMD of the Homelight or Homepower supply (refer paragraph 3.6.2).

3.17.2.1 Conversions from Businessrate 1, 2, 3 or 4 to Businessrate 1 ,2, 3 or 4

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.
- A change in meter type/meter fee may be payable where the conversion entails a change of metering equipment.

3.17.2.2 Conversions from Homepower to Businessrate, Megaflex, Miniflex or Nightsave Urban -or vice versa

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.3 Conversions from Homepower Bulk to Businessrate, Megaflex, Miniflex or Nightsave Urban

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.4 Conversions from Homelight to Businessrate

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.5 Conversions from Businessrate to Megaflex, Miniflex or Nightsave Urban

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.6 Conversions from Megaflex, Miniflex or Nightsave Urban to Businessrate

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.7 Conversions between Megaflex, Miniflex or Nightsave Urban tariffs

The following will be applicable:

- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.8 Conversions from Landrate/Landlight (20A or 60A) to Homepower, Homelight, Businessrate, Megaflex, Miniflex or Nightsave Urban

The following will be applicable:
- This conversion is only possible due to the re-classification of an area by Eskom to an urban area due to circumstances such as electrification or proclamation.
- The conversion will be done free of charge if there is no change in supply size and meter.
- If the supply is a Landrate three-phase or single-phase business supply, a conversion to Businessrate will be applicable.
- If it's for residential usage, then Homepower or Homelight should be offered
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- Outstanding MCCs must be capitalised to the electrification project.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.2.9 Conversions from Landrate/Landlight (20A or 60A) to Homepower, Homelight or Businessrate for schools and clinics

The following will be applicable:
- Only schools and clinics on a rural network may be given an urban tariff. This is the only exception allowed. In order to qualify for the urban tariff, no rural capital allowance is given and all actual costs are payable.
- The standard applicable tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.
- The NPV of any outstanding capital allowance (refer to paragraph 3.36 for how this is to be calculated).

3.17.2.10 Conversions from Nightsave (Rural)/Ruraflex to Nightsave (Urban)

The following will be applicable:
- This conversion is only possible due to the re-classification of an area by Eskom to an urban area due to circumstances such as electrification or proclamation.
- The conversion will be done free of charge if there is no change in supply size and meter.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion refer to paragraph 3.27.

3.17.2.11 Conversions to/from Megaflex Gen from/to Nightsave Urban, Megaflex or Miniflex

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment.

3.17.2.12 Conversions to new urban tariffs (not listed at the time of drafting this document)

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.

- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.3 Residential tariff conversions

3.17.3.1 Conversions from Homepower 1,2,3 or 4 to Homepower 1,2,3 or 4

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.
- A change in meter type/meter fee may be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.3.2 Conversions from Homelight 20A to Homepower 4

The following will be applicable:
- The tariff conversion fee is payable.
- This is an upgrade – refer to paragraph 3.18.1.2.
- A change in meter type fee will be payable where the conversion entails a change of meter, unless such a change is part of a meter-change programme by Eskom.

3.17.3.3 Conversions from Homelight 60A to Homepower 4 or vice versa

The following will be applicable:
- The tariff conversion fee is payable.
- A change in meter type fee will be payable where the conversion entails a change of meter, unless such a change is part of a meter-change programme by Eskom.

3.17.3.4 Conversions from Homelight 60A or Homepower 4 to Homepower 1, 2 or 3 or vice versa

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- A change of phase fee will be payable where the conversion entails a change of phase.
- A change in meter type/meter fee will be payable where the conversion entails a change of meter, unless such a change is part of a meter-change programme by Eskom.

3.17.3.5 Conversions from Homepower Bulk to LPU tariffs

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18. Note with Homepower Bulk it's possible that because the demand is not measured, that the Homepower Bulk supply may have an incorrect NMD and this should be corrected once actual demand is known.
- A change in meter type/meter fee may be payable where the conversion entails a change of metering equipment.

3.17.3.6 Conversions to new residential tariffs (not listed at the time of drafting this document)

The following will be applicable:
- The tariff conversion fee is payable.
- For downgrades and upgrades coinciding with the tariff conversion refer to paragraph 3.18.
- For a change of phase coinciding with the tariff conversion and upgrade refer to paragraph 3.27.
- A change in meter type/meter fee will be payable where the conversion entails a change of metering equipment, unless such a change is part of a meter-change programme by Eskom.

3.17.4 Conversions to/from Transmission/Distribution connected customers

The following will be applicable where a customer's connection point is Transmission or Distribution connected:

- A Transmission connected customer is a customer connected at >132 kV or if the voltage is lower where there are no Distribution assets (typically transformation equipment) between Transmission's assets and the customer's connection to the network. The direct Transmission charges and Transmission connection charge guideline will apply.
- `The decision lies with Eskom to decide on technical grounds whether a customer may be a direct Transmission connected customer at voltages of 132kV or lower.
- Where customers wish to purchase Distribution assets to enable them to be a direct Transmission connected customer, the Eskom procedure for the sale of assets shall be followed and the required delegation obtained before any customer is quoted a value for such assets.

3.18 Changes in NMD and/or MEC

Where changes in NMD and/or MEC occur, a connection charge / conversion fee will be required. **All changes in supply size/NMD must be in compliance to the NMD rules.**

It is possible that a customer's connection charge comprises both dedicated and upstream costs, e.g. a dedicated transformer and shared line and a capital allowance. This needs to be recalculated when a supply is upgraded or downgraded. The allocation of connection charges when supplies are downgraded or upgraded will be based on the following:

Table 1 - Allocation of connection costs when changes in NMD and/or MEC occur:

	Capacity reduced	**Capacity increased**
Asset 100% allocated and full cost recovered through connection charge	Connection charge adjusted (reduce pro-rata share and for loads adjust capital allowance). No SNC adjustment for dedicated costs.	Connection charge adjusted (increase pro-rata share and for loads, adjust capital allowance). No SNC adjustment for dedicated asset, only for upstream/shared.
Asset pro-rated – connection charge based on NMD/MEC (no work required)	Connection charge adjusted (reduce pro-rata share/SNC and for loads adjust capital allowance)	Connection charge adjusted (increase pro-rata share/SNC and for loads, adjust capital allowance)
Asset pro-rated – connection charge based on NMD/MEC (work required)	As above plus any additional costs less material credits	As above plus any additional costs less material credits

The above table refers to each component of all assets making up the connection charge and the actions required when changes in supply size occur.

3.18.1 Supply upgrades

For all supply upgrades, the customer is required to pay:

- The conversion fees as stipulated in the Standard Charges document.
- A connection charge (where applicable) that is based on the following:
  - All new work for urban tariffs (pro-rated where applicable) less any material credits.
  - The pro-rated costs or where SNC is applicable, the prevailing SNC rate multiplied by the increase in NMD.
    - For rural tariffs, SNC is only added for supply upgrades for that portion of the capacity that exceeds 100kVA. No SNC is payable on Landrate or Landlight supplies.
    - Where the upgrade requires upstream network strengthening, pro-rated costs instead of SNC will be used where the increase in load required by the customer amounts to 10% or more of the upstream network strengthening that has to be undertaken (refer to paragraph 3.6.1).

- Less the prevailing capital allowance rate multiplied by the increase in NMD associated with the standard supply. See paragraph 3.8.6 for standard supplies.

- SNC will not be charged for the portion of the connection charge raised on dedicated assets, but the connection charge will be adjusted to take into account the difference in capital allowance and any SNC on upstream assets. An upgrade will result in a new notice period being applicable (refer to paragraph 3.37).
- Existing monthly SCCs/RCCs/PCCs remain unchanged.
- Any premium connection costs.
- Where a customer ramps supply over time this is not seen as a supply upgrade (refer to paragraph 3.21).
- Where an upgrade requires a new installation, this should be treated as a new connection and not an upgrade.

3.18.1.1 Urban supply upgrades

The amount payable for an Urban supply upgrade is based on the following equation:

Equation 27: Calculation of connection charge for a supply upgrade (Urban)

The conversion fee PLUS allocated costs
Allocated costs are:
Applicable SNC R/kVA[1] x increase in NMD PLUS
+ Any additional work involved in upgrading the supply (actual or pro-rated)
+Overheads on actual cost
- Material credits (where applicable)
- Capital allowance x increase in NMD
+Escalation
= Connection charge required for new supply size but not beyond extinction
Please note that any original MCC is still payable for the outstanding period

[1]Allocated per tariff as per paragraph 3.6.2. For rural supplies no SNC ≤100 kVA.
Refer to paragraph 3.18.2.2 for the charges payable where a customer downgrades and then upgrades again.

3.18.1.2 Residential upgrades

The following equation is to be applied for residential upgrade:

Equation 28: Calculation of connection charge for a supply upgrade (Residential

The conversion fee PLUS allocated costs
Allocated costs are:
Applicable SNC R/kVA[1] x increase in ADMD PLUS
+ Any additional work involved in upgrading the supply (actual or pro-rated)
+Overheads on actual cost
- Material credits (where applicable)
+Escalation
= Connection charge required for new supply size but not beyond extinction
Please note that any original MCC is still payable for the outstanding period

[1]Allocated per tariff as per paragraph 3.6.2. For rural supplies no SNC ≤100 kVA.
Refer to paragraph 3.18.2.2 for the charges payable where a customer downgrades and then upgrades again.

3.18.1.3 Rural supply upgrades

For the rural tariffs the conversion fee contributes towards the connection costs therefore not subtracted from the project costs. The equation to be applied is:

Equation 29: Calculation of connection charge for a supply upgrade - Rural

The conversion fees PLUS allocated costs
Allocated costs are:

Increase in NMD x SNC R/kVA[1]
+ Any additional work involved in upgrading the supply (excluding transformer bank)
+ Conversion fees
= Connection charge required for new supply size.
Please note that any original MCC is still payable for the outstanding period

[1] For rural supplies no SNC <100 kVA is payable

For rural tariffs, Ruraflex and Nightsave (Rural), the only additional cost other than the conversion fee, is the HV SNC.

3.18.2 Supply downgrades

Where downgrades in NMD or MEC occur, a conversion/connection charge will be required. The appropriate notice period in terms of the **NMD rules** and this document (see paragraph 3.37 for the liability periods applicable) must be given before a downgrade is allowed. The conversion/connection charge will be based on the following:

3.18.2.1 Rural tariffs supply downgrades

- The prevailing conversion fee is payable. Refer to the Refer to the Standard Charges document for the conversion charges.
- There is no connection charge for the cost of the new transformer installed but all irrecoverable costs to remove existing equipment is payable.
- There is no SNC credit and no adjustment of the original connection charge given for a reduced NMD as this is offset against the new transformer allowance provided.
- No refunds for any material credits – transformer bank costs recovered through the tariff and not through the SCC.
- No downgrade of NMD will be allowed for the original customer within the 5 year contract period and therefore no reduction in SNC within this period.
    - However, if the capacity made available can be utilised by another supply on the network, the reduction in NMD may be allowed provided the customer pays for all irrecoverable costs such as dismantling and re-location of equipment. This is to prevent some under-recovery of investment being made for the higher transformer and bulk substation capacity (refer to paragraph 3.37.1).
    - If the customers pays for the full cost of the downgrade no extension of the liability period will apply (only the outstanding period).
- A 1 month notice period is applicable for downgrades that occur after the initial 60 month contract period has expired and provided no transformation or line equipment is replaced.
- Any downgrade that requires transformation or line equipment to be replaced carries a new 60 month liability period. This excludes the circuit-breaker change or meter change as this cost is paid for. Refer further to paragraph 3.37.1
- If line has to be replaced the full cost of such replacement (dismantling and construction of new line) is payable i.e. no further line capital allowance is given.
- If metering is to be replaced due to a downgrade refer to paragraph 3.16.
- If a genuine new customer (proof of change of ownership) takes over the supply, this above restriction on changing the NMD or tariff may be waived, but all irrecoverable costs will be payable. Where Eskom applied the R900 reduction in MCC/RCC, there will be no further reduction in MCC or RCC).
- Where SNC was not charged for (prior to the introduction of SNCs), no adjustment of the connection charge will apply using the SNC for Nightsave Rural and Ruraflex supplies.

Equation 30: Calculation of new connection charge due to supply downgrade – for rural

Existing SCC ignored
Additional work
+ Metering installation cost (if required)
+ Conversion fee
= Connection charge
NOTE THAT NO NEW WORK COSTS ARE PAYABLE UNLESS LINE IS CHANGED

*Not applicable where SNC was originally not raised.

3.18.2.2 Urban tariffs supply downgrades

For urban tariffs, the following is applicable:

3.18.2.3 Urban tariff supply downgrades for connections where SNC has been applied (post 2002) and where capital allowances were applied

- The prevailing conversion fee is payable PLUS if applicable the allocated costs. Refer to the Standard Charges document for the conversion charges.
- A new connection charge may be raised by increasing the connection charge to take into account the capital allowance that should have been applied on the lower NMD (this increases the connection charge) and the SNC that should have been applied on the lower NMD (this reduces the connection charge).
- The revised connected charge will be calculated as follows:
  - All new work (pro-rated where applicable) less any material credits.
  - Less the original SNC rate multiplied by the decrease in NMD.
  - PLUS the original capital allowance rate multiplied by the decrease in NMD.
- Any existing MCC or connection charge is not adjusted by the downgrade.
- The notice of the required downgrade must be given in terms of the NMD rules, the contract and of this document (See paragraph 3.37.2).
- For downgrades of residential tariffs refer to paragraph 3.18.2.4).

Equation 31: Calculation of supply downgrade contribution for urban supplies after SNC was introduced

Revised standard connection charge
+ Additional work
- Decrease in NMD x original SNC R/kVA
+ The original capital allowance rate[2] multiplied by the decrease in NMD =
=Revised standard connection charge (if negative the connection charge will be zero) [1]
+ Conversion fee for a downgrade
+ Where applicable, the conversion fee for a tariff conversion (see paragraph 3.17.2)
The existing standard connection charge remains payable and is not reduced.

[1] Cannot be less than zero as the capital allowance can never rebate allocated costs beyond extinction.
[2] For Homepower there is no capital allowance – refer to Appendix 2 (paragraph 1.2.1).

If a customer's standard connection charge is initially negative (then defaulted to zero) and later upgrades, the negative value must be taken into account when calculating the new connection charge i.e.the difference between the negative value at the original SNC and capital allowance and the new SNC and capital allowance for the upgrade.

3.18.2.4 Urban tariff supply downgrades for connections made before SNC were introduced or where capital allowances were not applied

- The customer will pay the conversion fee as stipulated in the Standard Charges document PLUS if applicable, the allocated costs where work is required.
- No SNC calculation (as this was originally not charged to the customer).
- A new connection charge will be calculated as follows:
  - All new work (pro-rated where applicable).
    - PLUS the original capital allowance rate multiplied by the decrease in NMD. If the supply was originally connected before capital allowances were introduced or the supply is older than 25 years, then no capital allowance adjustment is to be applied.
- The notice of the required downgrade must be given in terms of the NMD rules, the contract and of this document (See paragraph 3.37.2).

The formula for calculating the connection charge is:

Equation 32: Calculation of supply downgrade contribution for urban supplies before SNC was introduced or where capital allowances were not applied

Revised standard connection charge
+ Additional work less any material credits
+ If applicable[1], the original capital allowance rate multiplied by the decrease in NMD
=Revised standard connection charge (cannot be less than zero) [2]
+ Conversion fee for Megaflex, Miniflex and Nightsave urban
+ Where applicable, the conversion fee for a tariff conversion (see paragraph 3.17.2)
The existing standard connection charge remains payable and is not reduced.

[1] This adjustment is only required if the original connection charge received a capital allowance. If no capital allowance (such as older supplies or residential tariffs) was applied or the supply is older than 25 years, no capital allowance adjustment is required.

[2] Cannot be less than zero as the capital allowance can never rebate allocated costs beyond extinction.

3.18.3 Generator MEC downgrades or upgrades

For generator MEC upgrades or downgrades, all actual costs as per Equation 14 and Equation 15 will be payable in addition to any standard charges. Credits may apply if equipment can be reused elsewhere.

3.19 Quotations and supply agreements

No project shall proceed without the budget quote conditions being met and / or accepted and all required payments received. If a project is erroneously allowed to proceed without such agreements, then the project shall not be energised without the customer having signed the electricity supply agreement or the connection and use of system agreement.

3.20 Accuracy of cost estimate letters and budget quotations and calculation of the outstanding estimated connection charge at budget quotation stage and the final connection charge after completion of the project

3.20.1 Cost estimate letter

The cost estimate letter is provided by Eskom upon application for a new connection and gives indicative cost information. The content of a cost estimate letter is based on certain engineering assumptions and is provided to a customer to assist in making a decision whether or not to proceed with the project and then to request a budget quotation.

The cost estimate letter is not a quote and no information contained in the cost estimate letter is binding on Eskom except for the value of the quotation fee and its validity period. The customer will be required upon application to pay a cost estimate fee before the provision of the cost estimate will be actioned.

3.20.2 Budget quotation

The budget quotation provides detailed terms and conditions to be met and gives capital cost estimates to a confidence level of 85%. This is determined by Eskom and is not a set amount and is dependent on the project scope. This fee is provided in the cost estimate letter and is payable at the time of applying for a budget quote. The actual capital costs that Eskom may incur in making this supply available may differ from the estimated capital costs.

The budget quote also allows for certain costs that are not in Eskom's control as a pass-through to the customer and these costs are based on actual costs and are not therefore subject to the 85%.

For a self-build project, monopoly works costs are a full pass-through and are not subject to the 85% cost confidence level.

3.20.2.1 Payment of the cost estimate fee/quotation fee and calculation of the outstanding estimated connection charge

A cost estimate fee may be required to produce a cost estimate and a quotation fee may be required to proceed with a budget quotation. The cost estimate fee and/or quotation fee are considered as part of the initial upfront payment.

This fee is the minimum amount payable and is part of the allocated connection charge and the customer is required to pay the difference upon acceptance of the budget quote. The minimum amount payable is the higher of the allocated connection costs less if applicable the capital allowance and/or quotation fee.

- The cost estimate fee is:
  - The amount payable to produce a non-binding cost-estimate. Eskom resources are used to produce a cost estimate and for this reason, a fee is raised to cover such costs. This is a predetermined fee published annually.
- The budget quotation fee:
  - This will typically cover costs such as survey, environmental impact assessments, detailed design and in some cases ordering of long lead time materials.
  - The quotation fee is seen as a contribution to the connection costs and should include reasonable escalation to take into account the time between producing the cost estimate and when the costs will be incurred on which the quotation fee is based.
  - Is part of the connection charge and if the cost associated with this fee is included in the project costs quoted at the time of the budget quote, this must be subtracted from the cost.
  - If there is a scope change at budget quote stage that results in a significant reduction in costs for example, the budget quotation fee is based on an Eskom build and the customer opts to do self-build, the customer must be refunded any amount paid in excess of the estimated connection charge. At the final reconciliation and if the actual cost is higher, the customer may be required to pay an additional connection charge (refer to paragraph 3.20 for the final reconciliation of costs).
    - Note this "refund" at the budget quotation stage is not the same refund that is applied when there is sharing (refer to paragraph 3.14 for the document for refunds due to sharing). Therefore generators will be entitled to receive a refund of any charges paid that are higher than estimated (at budget quotation stage) or actual costs (at final reconciliation stage).
  - If quotation fee < estimated connection charge, the normal formula for calculation of the connection charge will apply (refer to
  -
  -
  -
  - Equation 13: Calculation of standard connection charge).

Equation 33: Calculation of outstanding estimated connection charge at budget quotation stage

Estimated Connection charge based on budget quotation costs
- CEL fee
- Transmission budget quotation fee (if applicable)
- Distribution budget quotation fee
= Balance of connection charge estimate still payable or to be refunded[1]

[1]If the amount is negative the customer must be refunded this amount at budget quotation stage. If positive this is the amount still payable by the customer.

3.20.3 Calculation of the (final) connection charge completion of the project

Upon the final reconciliation of actual costs at FRA stage, the connection charge estimate may require to be amended as follows:

Equation 34: Reconciliation of final connection charge

Allocated estimated capital costs (pro-rated if applicable) including overheads and escalation

- Allocated final capital costs (pro-rated if applicable) limited to +15% plus any change in actual costs outside of Eskom's control due to scope changes and other factors such as material and labour costs increasing at a rate greater than PPI and forex fluctuations.
+ Estimated monopoly works
- Actual monopoly works costs
= Final cost to be allocated to the customer in final connection charge
= Calculate final connection charge on final costs as per
Equation 13: Calculation of standard connection charge urban and Equation 14: Calculation of connection charge for an embedded generator.
- Estimated connection charge
= Amount still payable or to be refunded to customer

An invoice must be sent to the customer reflecting any additional connection charges required to be paid or any portion of the connection charge to be refunded.

Eskom will refund any actual variance (i.e. not subject to +15% of the actual cost) should the connection charge estimate amounts (including the cost estimate fee and the quotation fee) paid be more than the final connection charge amounts calculated based on the actual expenditure for the completed connection. This variance will be refunded within 6 months after supply is made available or when the final cost reconciliation is done. If actual final costs are lower, they are not subject to a 15% variance and the full difference is refundable.

3.21 Ramping of capacity

Due to a customer's expanding operational requirements, capacity may be installed that is in excess of the customer's initial demand where the NMD will ramp up over time.

The connection charge estimate and guarantees will be based on the NMD at each stage of the ramping process.

The final connection charge estimate is based on the final NMD of the ramping process and cannot be lower than the minimum connection fee. An ETG must be raised based on each stage of the ramping. As the NMD is increased and the capital allowance is applied on the higher NMD, the ETG reduces.

- If the asset is dedicated, the connection charge estimate for the capacity installed will be based on the total costs of the capacity installed and not on the final required NMD. The SNC and capital allowance however is calculated on the NMD required at each stage of the ramping process.
- If the asset is shared the connection charge estimate for the capacity installed will be based on the pro-rated costs of the capacity installed and adjusted each time the supply is ramped. The SNC and capital allowance however is calculated on the NMD required at each stage of the ramping process.

Conversion fees are not payable each time the customer increases NMD up to the threshold agreed in the ramping agreement. Any changes not included in the budget quote will result in a new quote.

- Escalation is calculated on the initial connection date.
- The ETG is re-calculated at each stage of the ramping of the NMD, adjusted for the capital allowance given. This means that the ETG value will increase cumulatively over the ramping period as the capital allowance is credited.
- The ETG reduction period, i.e. 13 years starts from the date of the final ramp.
- Capital allowance shown as a credit on bill (must forecast this).
- The ramping period may not be longer than 4 years. The period of 4 years is determined as reasonable and a minimum period is required as the ramping process should not be open ended. If a longer period is required this needs to be motivated and approved in terms of the Eskom Delegation of Authority.

3.22 Reserving of capacity

Customers may decide to request capacity in excess of their operational requirements. The customer will pay for such costs through the tariff charges. The SNC and capital allowance provided will be based on the NMD. If the supply is downgraded at a later stage, downgrade connection charges may apply (see paragraph 3.18.2).

3.23 Moving of assets to balance supply and demand

Customers will be required to pay for the fair and reasonable costs associated with re-balancing capacity and demand where this is required to meet their changing requirements, over and above any other allocated costs.

Eskom's normal investment policy is to install the least cost technological minimum capital equipment at each POD that is required to meet the customer's load requirements. Over time it happens that the available capacity becomes out of balance with the customer's load requirements for, amongst others, the following reasons:

- Changes in a customer's supply size, whether an increase or a decrease in capacity.
- Operational re-structuring of customers' businesses may cause the capacities at PODs to become unbalanced with the load required.
- Constraints on the customer's network where the capacity required can be better accommodated from another source.

Eskom therefore needs to optimise its capital investments by continuously ensuring a close match between installed capacity and the customer's load requirement. The following needs to be addressed in order to achieve this:

- Eskom reserves the right to remove under-utilised equipment from any POD provided that the necessary pricing adjustments are made to the customer's connection charges.
- Eskom may relocate equipment from a POD with over-capacity to a POD of the same customer that has inadequate capacity. The customer is required to pay all associated costs of moving the assets and the connection charge must be adjusted accordingly for each POS. Customers will be given reasonable notice and where required a quotation of Eskom's intent to remove or relocate assets.
- Equipment installed in order to provide a premium supply to a customer may not be removed without the customer's consent.
- Removal of plant from a POD will be free of charge to the customer releasing the equipment:
  - For standard supplies, this will be treated in the same manner as refurbishment of any other standard supply. Refer to paragraph 3.10.3.
  - For premium supplies the customer will be liable for the cost of refurbishing the equipment associated with the premium supply (refer to paragraph 3.10.4).

The connection charges raised will be done in terms of the following principles:

- The customer will pay for all dedicated costs.
- Where the work performed is based on least cost standard supply, the connection charge raised is considered a SCC.
- Where a customer requests the retention of the surplus plant at the POD, the cost of the plant that could have been removed will be converted into a PCC.
- If any upstream work is required to accommodate the shift in load, the customer will be required to pay for this cost.
- If the network has the capacity to accommodate the shift in existing load (i.e. the overall demand of the customer remains the same) no SNC is payable – only dedicated costs.
- The capital allowance is only given to off-set additional costs resulting from an increase in capacity i.e. the capital allowance is based on the additional demand only and not simply to off-set costs arising only from the rebalancing/moving of load.
- If there are no actual costs and where the shift in capacity is to Eskom's benefit, there will be no charge to the customer.

3.24 Shifting of load from one POD to another

It is sometimes requested by customers who take supply from more than one POD that load be shifted from one POD on the network to another POD on the network. The reason is normally that one POD is exceeding its NMD and the other POD rarely reaches its NMD.

This will be allowed subject to the following:

- Must be supplied form the same MTS, but does not have to be on the same feeder.
- Do not have to be on the same account number but must supply the same customer.
- Must be evaluated by network planning

The following will be applied to the raising of connection charges:

- When multiple supply points on the same network belonging to the same customer require a supply decrease on some of the points and a supply increase on other points with no overall change in demand, no additional SNC will be required to be paid providing that network planning has confirmed the availability of capacity on the network where it is needed.
- Where network planning confirms that work is required to accommodate the shift in NMDs, a connection charge is payable.
- If there are no actual costs and where the shift in load is to Eskom's benefit, there will be no charge to the customer, including no minimum connection fee.
- Where the shift in load is not adding additional benefits for Eskom.
  - For an increase in overall NMD, treat as an upgrade of supply (refer to paragraph 3.18.1).
  - Where there is no change in overall NMD, the higher of the minimum connection fee or actual costs if any will be payable.
  - For a reduction in overall NMD, treat as a downgrade of supply (refer to paragraph 3.18.2).

3.25 Allocation of externality costs

As a rule, costs associated with complying with externality costs such as environmental laws will not be charged directly to the customer and will be pooled into the tariff rates and recovered from all customers.

There could be circumstances where this rule could not apply such as:

- Where there is a game farm or nature reserve and Eskom is required to supply underground cables due to environmental considerations. Where possible underground cables should be avoided where no servitudes exist i.e. the customer should be made responsible for such networks. If Eskom does provide and maintain cables, the difference in cost between an overhead line and cables is payable by the customer as an up-front premium expenditure contribution.
- Again in a game farm, where higher than standard poles are required due to the wildlife, the difference in cost between the standard size poles and the required poles is payable by the customer as an up-front premium expenditure contribution.

As a general guideline, the following could be used to assist in a decision whether to charge or not:

- If the application of the law is to the benefit of one customer, the customer is liable for all the costs and will be charged an up-front contribution (as in the game farm example above).
- If it is to the benefit of all i.e. in the national interest and as per legislation, the cost will be automatically pooled and shared by all customers.
- The costs of undertaking an Environmental Impact Assessment are allocated to the project for which the assessment is done.

3.26 Fast-tracking of projects or bringing forward network strengthening

It may happen that a customer requests Eskom to bring forward the date of the construction of a project from that date that Eskom initially planned. Eskom may be able to expedite the project but requires the customer to pay all additional incremental and acceleration costs arising from the fast-tracking of the project. This will include the cost of installing and removing temporary equipment. This is, however subject to the availability of funding for the Eskom portion of costs. Refer to paragraph 3.3 as to how this will be dealt with.

3.27 Change of phase and line

The following charges are applicable when a customer changes from SWER or phase to phase to three-phase or vice versa:

3.27.1 From three-phase to SWER or single-phase conversions

The amount payable is the full actual costs to convert the line from a three-phase to a single-phase supply. Take into consideration the tariff conversions allowable in these circumstances.

3.27.2 From SWER or single-phase to three-phase conversions

The amount payable is 1) the full actual costs if Eskom is required to convert a SWER or single-phase line to three-phase line or 2) NAP costs if no work is required.

- Actual costs are payable on the costs to dismantle an existing line and rebuild a three-phase line.
- NAP costs are payable where Eskom has required the T-off to be three phase, but the customer initially requested and was allocated costs based on single phase. The customer was charged based on single phase NAP for the T-off but three phase NAP for the backbone. If the supply is later upgraded, no work would be required to upgrade the line, but the customer will be required to pay the difference in the current single-phase NAP line costs and the current NAP costs of the three-phase supply. Any additional actual costs will also be charged to the customer and no additional line allowance is granted.

No line allowance is given on the line conversion cost, as a line allowance has already been given with the original construction. Where a change of phase results in an upgrade of capacity additional SNC (where applicable) and capital allowances associated with the change in capacity will apply.

3.28 Take-over of non-standard technology

Where non-standard technology is installed, Eskom reserves the right to take-over this equipment or not. If this equipment is taken over by Eskom, the equipment will be considered a premium power supply/asset (see paragraph 3.2.4.2. If Eskom is not prepared to maintain and refurbish non-standard equipment, this equipment will not be taken over and Eskom will meter the point at a position before the non-standard equipment. Non-standard technology could refer to, amongst others, non-standard voltages, non-standard metering, underground cable in rural areas, overhead cable in urban areas where the standard is underground cable, etc.

It may occur that technical standards have changed resulting in non-standard equipment previously installed by the customer now being regarded as an Eskom standard. In such a case, Eskom will maintain and refurbish this equipment subject to the equipment being transferred at no cost to Eskom.

3.29 SWER technology

Where SWER technology is used, the cost of the isolating transformer is to be added as a dedicated cost to the project, and raised as a cash up-front payment. All customers sharing off a SWER network will be required to contribute towards this cost as follows:

Equation 35: Allocated cost for SWER isolating transformer

Cost of isolating transformer / Σ Customers' NMD = R/kVA share per customer

3.30 Temporary supplies

Temporary supplies are supplies that would normally not be required for an indefinite period and termination would occur within approximately. 3 years. The connection charge for temporary supplies required for periods of less than one month will be calculated based on a minimum period of one month. This does not include temporary equipment installed for a permanent supply (refer to paragraph 3.26).

The customer will be required to pay for all irrecoverable costs plus a pro-rata share of recoverable cost, SNC and capital allowance as per the following formula:

Equation 36: Calculation of connection charge for a temporary supply (urban and rural)

SNC on a R/kVA basis x NMD
+ NAP[1] or actual allocated costs if applicable
+Overheads on actual allocated costs (refer to 3.7.4)[2]
- Irrecoverable costs excl. escalation
- Capital allowance[5] (if applicable) (but not greater than the total allocated Distribution costs + overheads) x NMD
+ Escalation on all of the above[6] (refer to 3.7.8)
= Sub-total x pro-rated period[4]
+ Irrecoverable costs[3] incl. escalation
= Total estimated Distribution connection charge or connection fee, whichever is the greater
- CEL fee already paid (if applicable)
- BQ fee already paid (if applicable)
= Outstanding estimated Distribution connection charge

[1]Use NAP for rural supplies.
[2]Not to be added for rural.
[3]The irrecoverable costs are not pro-rated as they are paid up front. Refer to Equation 37.
[4]Pro-rated period = (no. of months required ÷300 months).
[5]Capital allowance for rural supplies is the pro-rated transformer and line allowance.
[6]If escalation is added to any actual costs do not add escalation again on actual costs.

Where CT/VT units are installed and a contribution is required (i.e. not fully rebated by the transformer capital allowance), then the CT/VT capital allowance must also be pro-rated.

Should the customer want to extend the temporary period, one month's notice will be required and a requote will have to be provide. Such terms will have to be include in the quote letter

Where upgrading of a temporary supply occurs, Equation 36, will apply to any actual costs or SNC applied to the incremental capacity. For temporary supplies the irrecoverable cost is calculated as:

Equation 37: Calculation of irrecoverable costs for a temporary supply

+ Transformer + Meter material costs: 30%[1].
+ Line/cable material costs: 100%[2]
+ Line/cable and transformer labour and transport costs 100%[3]
+ Other costs: 100%[4]
+ Dismantling: 50%[5] of labour and transport for both transformer and line/cable
+ Overheads: 100%[6]
=Irrecoverable cost excl escalation
+ Escalation if applicable
= Irrecoverable costs incl escalation

[1] 30% of the transformer material costs is assumed to be irrecoverable (use NAP for rural). If supplied from an existing transformer costs will be zero.
[2] 100% line/cable material costs irrecoverable (use NAP for rural).
[3] 100% labour and transport costs for both the line/cable and transformer are considered irrecoverable (use NAP for rural).
[4] 100% other costs (contingency, survey, design, COW, etc.) (Not applicable to rural)
[5] 50% of the labour and transport costs is assumed to apply to the dismantling of the supply (use NAP for rural).
[6] 100% of overheads (use NAP for rural).

The customer will be liable for the payment of the network charge for at least the period on which the capital allowance will be based. The contract liability period for temporary supplies will be the period stipulated by the customer as the temporary supply period. See paragraph 3.37.

If the supply gets used for a longer period, once the supply is disconnected, the customer may receive a refund provided that the actual costs initially quoted, were not exceeded on dismantling or have to pay an additional connection charge based on the longer period. If the customer cancels before the stipulated contract period, the contractual liability charges will still be payable before the contract can be terminated.

3.31 Temporary disconnections

A customer shall be allowed to request a temporary disconnection of the supply. This will not entail a termination of the account but only a temporary interruption in the power supply. The customer will remain liable for any fixed charges and any charges related to the cost to disconnect and then connect the supply. Refer to paragraph 3.37.

3.32 Temporary supplies associated with mobile transformers

The Mobile Reticulation Transformer (MRT) is a ground mounted mini transformer intended for temporary service loads and customers requiring a mobile electricity supply. The Eskom owned MRT is aimed at parties that require a supply for a short usage period (less than 3 years uninterrupted). The MRT is intended for "run of line" applications i.e. where the MRT can be tapped from existing Eskom lines without having to build additional lines.

Eskom owns, supplies and installs the MRT. The MRT is for supplies less than a period of 3 years. Customer pays a connection charge and all irrecoverable costs up-front.

3.32.1 Incremental lines/cables cash payment

In all cases, due to the possible temporary nature and short duration of the MRT or MMU the total cost, including irrecoverable costs and dismantling cost of the incremental lines/cables will be payable up-front. The total irrecoverable costs and dismantling cost, irrespective of the duration of the supply for the metering unit will also be payable as a cash up-front payment.

3.32.2 Connection charge for use of the MRT

The total costs of the MRT, MMU and standard metering unit will be payable as a connection charge as per Equation 36: Calculation of connection charge for a temporary supply, every time the MRT or MMU is utilised to supply a new customer, and based on the following assumptions:

3.32.3 Moving of MRT or MMU

When a customer requests a move of the MRT or MMU is moved by the customer, resulting in the moving of the Eskom standard metering unit by Eskom, the costs, of such a move are payable as a connection charge before any Eskom work takes place as recoverable work (refer to paragraph 3.35).

The move of a MRT or MMU will always be arranged by Eskom and be done under the supervision of authorised Eskom Field Services staff. Should the customer choose to move a MRT an Eskom approved contractor authorised by Eskom can be used to do so on application from the Customer. A MMU will at all times be moved by Eskom. The customer is responsible to ensure that adequate insurance against any damage, during a move, to a MRT is in place. This also includes failure of the MRT on start-up due to unforeseen damage.

3.32.4 Sharing of existing networks due to the installation of an MRT

The sharing of existing networks will only be applied in cases:

- Where other customers demand that sharing be applied.
- Where five or less than five customers share an existing line and a MRT is connected to the line and a SCC (scheme minimum) is applicable.

Recalculating and adjusting the SCC's of all customers sharing the existing network as a result of the commissioning of a MRT should be communicated in writing to all customers impacted.

SNC will be recalculated if NMD changes as per the size of the MRT.

3.32.5 Capital allowance associated with an MRT

No capital allowances shall be granted for a MRT or MMU.

3.33 Temporary changes in NMD/MEC

Refer also to the NMD/MEC rules.

3.33.1 Temporary increases in NMD/MEC

The customer will allowed to temporary increase the NMD/MEC in compliance to the NMD/MEC rules. A quote will be provided to allow such a temporary increase. If

The following conditions must be applied when granting a temporary increase in NMD to a customer:

- No actual costs will be payable if capacity on the network is available to provide the additional capacity.
  - For loads, the customer may be required to pay the greater of the pro-rated SNC less capital allowance or the connection fee whichever is the greater. Pro-rating will be treated the same as for a temporary supply.
  - For generators the amount payable will be the minimum connection fee.
- If capacity is not available Engineering needs to do a detailed network investigation.
  - Actual costs are payable plus for loads a pro-rata sharing of SNC and capital allowance less any recoverable costs or the connection fee whichever is the greater.
- The customer will be required to pay all cost for the temporary increase to be implemented.
- An amended supply agreement will be concluded together with the acceptance of the quote. The temporary increase will be for a defined period only, after which the NMD will be reset on the billing system to the previous value.

If the customer wasn't granted a temporary increase in supply and the increase was only affected on acceptance of the budget quote, then the customer's cost would have been:

3.33.2 Temporary increase in NMD on the billing system for customers that have applied for a supply upgrade

Eskom will allow an interim increase in NMD on the billing system where the customer has applied for an upgrade where Eskom is in the process of implementing this increase. The customer will have had to apply, accept the quote and pay the required connection charge. Refer to the **Demand Exemption Policy and Procedure** for the rules where this is allowed.

3.33.3 Temporary reduction in NMD

These are not allowed in terms of the NMD rules. A reduction will need to be permanent and quoted in accordance with paragraph 3.18.2.

3.34 More than one point of delivery per stand/property

3.34.1 Megaflex, Miniflex, Nightsave (urban) and Businessrate

There is no specified limit to the numbers of supplies allowable for the above tariffs on one property. Additional points of delivery will be made available when requested by the customer, subject to Eskom's least life-cycle cost criteria.

Any cost in addition to the standard cost of extending an existing point of delivery, will be treated as a premium expenditure (see paragraph 3.9).

Refer to the **Diversity Policy and Procedure** dealing with diversity where this is applicable.

3.34.2 Ruraflex, Landrate, Landlight 60A and Nightsave (rural)

As a rule, additional points of delivery will not be made available within a distance ("as the crow flies") equal to the capital line allowance distance. This is to prevent Eskom spending capital on reticulating a customer's property and to avoid customers applying for additional points to not pay certain tariff charges.

Where customers insist on additional points and Eskom believes it is not warranted due to technical or least life-cycle cost grounds (such as requiring Eskom to reticulate a property, when it is feasible for the customer to do it), these additional points can be refused or be treated as a premium expenditure and actual costs are payable with no capital allowance being given. The connection fee is not charged in addition to the actual costs.

3.34.3 Residential freehold

Mainly due to electrification, more than one point of delivery has been allowed on residential properties. More than one point of delivery on a residential property must, however, not be seen as the ideal situation. An alternative solution could be to provide one bulk POD and the customer must then reticulate his property further. Customers requiring an additional point of delivery and where Eskom considers this not warranted, will be required to pay a higher than standard connection fee, as per the Standard Charges and where applicable an additional connection charge.

This decision to allow an additional point of delivery will be the prerogative of the operating unit management.

3.34.4 Sectional title developments

A sectional title development/complex is one property and typically supplied by Eskom through a bulk supply at the boundary of the property. The reticulation, internal wiring, maintenance, metering and tariffs charged to all homeowners/units within the complex is usually managed by the body corporate. It is Eskom's preferred option that the supply to a sectional title development/complex is provided as a bulk point of supply. If individual supplies within the complex are requested, Eskom will consider this on technical and economic grounds. If approved these may only be provided at a common metering point (or points) at the boundary or through a split-meter. Eskom will, however, not be responsible for any aspect of the internal wiring within complexes.

3.35 Recoverable works

Recoverable works are works that are not for the purpose of establishing a new connection or enhancement. An example of recoverable work would be the shifting of an existing line.

- In most cases recoverable work will be allowed to be done on a contestable basis, i.e. the customer should be allowed to choose the cheapest Eskom approved contractor to do the work, unless there are technical reasons that require Eskom to provide the service (such as work on infrastructure that provides supply to other customers.
- This work is not subject to the standard quotation criteria and actual costs are payable i.e. no use of NAP and not limited to a cost confidence percentage.
- No SNC or capital allowances are applicable to recoverable work.
- Any work Eskom does for a Developer is also to be considered recoverable work.

There are specific issues related to some recoverable work projects such as line shifts or re-location of meters / transformers which are addressed in the following paragraphs.

3.35.1 Line shifts

Any costs associated with the shifting of lines, equipment and/or substations on the request of a customer will be for the customer's account. The customer could be given the choice of using a self-build Eskom approved contractor, but this would be a decision of the operating unit management.

The following is payable:

- Any current monthly connection charges will remain applicable.
- The full cost associated with dismantling the existing line is payable.
- The actual costs for any portion of new line built are payable. No SNC or line allowance is applicable to the new portion of line built.

However, where customers have signed a wayleave agreement that allows for one free shift of line for bona fide farming purposes, such shift of line will be done free of charge for the Eskom determined shortest route to cater for the bona fide farming purposes. Such wayleave agreements were applicable from approximately 1985 to 1989. The wayleave is applicable only to the original signee but the free line move can be transferred from an owner to its successor (new owner) by way of cession. Until such cession takes place, the right is not transferred, i.e. the transfer is not necessarily automatic. Should a business be sold as a "Going Concern" and the land/property is used for purposes of that business, the free line move is ceded.

For a free line move Eskom will determine the shortest route to cater for the farming purposes. If the customer requires a longer deviation than the minimum route, the customer will be liable for the cost difference, i.e. any extra line built. The customer is not liable for any additional costs where the Eskom determined shortest route is longer than the original line length.

Where Eskom is requested to dismantle a line, the following conditions are applicable:

- Where the party requesting the dismantling of the equipment is not an Eskom customer (no supply agreement) or Eskom does not have a wayleave/servitude agreement with the owner this cost will be for Eskom's account.
- If the party requesting the dismantling of the equipment is an Eskom customer (has a supply agreement) or Eskom has a wayleave/servitude agreement, the customer is liable for any costs payable.
- If the wayleave agreement allows (in the name of the owner) for one free line move (agreed in the 1980's) for farming purposes this is for Eskom's account. It needs to be verified if the move is for farming purposes and if it's the first free line move as allowed for in the wayleave.
- If no wayleave agreement exists and it's on the property of an Eskom customer with a supply agreement this cost will be for customer's account as recoverable work (refer to paragraph 3.35). This is a different issue to the free line move.
- If it's due to termination of supply by the customer and if there is an ICG or an ETG, the appropriate amount will be claimed. If there is outstanding amounts, Eskom will claim this from the customer.
- If the network to be dismantled supplies other customers, Eskom will deviate the line using the shortest route.

3.36 Using the NPV and the PV of an annuity formula to determine monthly charges and outstanding capital allowances

The NPV or PV formula is used to calculate an outstanding connection charges or capital allowances that is payable when a customer terminates or makes changes to their terms and conditions that requires to raise a charge. An example would be a customer that converts to Landlight 20A from Landrate and is required to pay the NPV of an outstanding capital allowance.

Eskom uses a compounded interest rate determine monthly connection charges and the NPV of capital allowances. The monthly interest rate is <u>not</u> the annual interest rate/12 but is calculated using the following formula:

Equation 38: Calculation of compound monthly interest rate.

$$im = (1+ i)^{1/12}-1$$

im = compound monthly interest rate

i = annual interest rate[1]

[1] - When being applied to MCCs that have fixed interest rates, use the annual interest rate at the time of original quotation.
- When being applied to MCCs that have variable interest rates, use the annual interest rate at the time of new quotation
- When being applied to capital allowances or downgrades, use the interest rate at the time of new quotation.

Monthly connection charges are no longer applicable, except where they have been approved by in terms of the **Phased payment of Connection Charges for Municipalities Policy**.) If the value has to be calculated, the following formula is to be used:

Equation 39: Calculation of the MCC

$$C = PV \times \frac{im}{1-(1+im)^{-n}}$$

n = total no of months for payment

R = allocated connection charge

PV = Initial investment/capital amount

Equation 40: Calculation of PV of a MCC

$$PV = C \times \frac{(1-(1+im)^{-n}}{im}$$

n = no of months connected

R = monthly value of revenue received/payment

The NPV formula must be used when determining the outstanding value of the capital allowance as this is a series of cash inflows that increases at the price increase whereas the PV formula assumes a fixed monthly or annual payment. Please contact Electricity Pricing to provide determine the outstanding capital allowance model.

3.37 Minimum liability (notice) period for termination of supply by the customer

For minor works projects, a liability period is required on contracts instead of an ETG to ensure that in the event of early termination by the customer, an appropriate amount can be recovered from customers to cover costs invested in providing supply. For major works projects an ETG is required with minimal notice period, refer to paragraph 3.12.2. The following rules are applicable once a supply contract is terminated.

Situation (within liability period)	**Action by Eskom**
1. Customer terminates the agreement without another customer taking over the supply immediately.	• Customer responsible for balance of liability of all fixed network charge based on outstanding contract period.
2. Customer terminates the agreement and another customer takes over the supply immediately.	• Transfer the supply. Applicable liability period for customer who takes over the supply.
3. Customer has terminated the agreement and paid the outstanding balance of liability as no other customer took over the supply immediately but subsequently another customer takes over the supply at a later date that is still within the original liability period.	• If previous customer can be traced, calculate refund of liability and sign contract with applicable liability period for new customer.
4. Customer requests temporary disconnection of supply without terminating the agreement.	• Customer remains responsible for the monthly payment of fixed network charges until agreement is terminated or transferred. The customer will always be responsible for the monthly fixed network charges, until the agreement is terminated or the supply is transferred.
Situation (within liability period)	**Action by Eskom**
5. Customer terminates the agreement without another customer taking over the supply immediately.	• No payment of liabilities as liability period has lapsed
6. Customer terminates the agreement and another customer takes over the supply immediately.	• Transfer the supply. Applicable liability period for customer who takes over the supply.
7. Customer requests temporary disconnection of supply without terminating the agreement.	• Customer remains responsible for the monthly payment of fixed network charges until agreement is terminated or transferred. Although the liability period has lapsed, the customer will always be responsible for the monthly fixed network charges, until the agreement is terminated or the supply is transferred.

3.37.1 Notice period for rural tariffs

Where there is no ETG:

- The minimum liability period from the date of initial connection is 5 years, due to the high capital allowances given. The contract period may be extended in proportion to the risk. Where a supply is taken over within the 5 years (see Section 3.38) the subsequent customer will be required to have a minimum liability period of the difference between 5 years and the period the supply has been used.
- No new liability period is applicable to a new customer that shares a transformer once the original liability period has elapsed.
- If the supply is older than 5 years, the minimum liability period for a transfer is one month. A customer may not, however, use this to avoid paying fixed charges for seasonal benefit.
- The contract period clause is applicable for all new Landrate, Ruraflex and Nightsave (Rural) contracts.
- An upgrade or downgrade in supply where equipment, except for the circuit breaker and meter is changed (i.e. the transformer or line) will result in a new 60 month liability period being applicable
- An upgrade or downgrade in supply where no equipment, except for the circuit breaker or meter, has to be changed will not result in a new 60 month liability period, but the remainder of the original liability period will be applicable.
- All fixed network charges are payable for the notice period. Previously the NPV of the MCC would have also been raised for the remainder of the notice period, however, due to the fact that with effect from 1 April 2009 all connection were paid upfront by customers, no supply with MCCs would still fall within the 60 month liability.
- No notice period is applicable to Landlight 20A or 60A as these are prepaid supplies. This impacts the line allowance that is being provided. See also paragraph 1.1.1 in Appendix 2.

Where there is an ETG.

- One month notice period
- Claim against the ETG for early termination.
- Any outstanding value of the ETG is applicable or transfer to new customer in the event of take-over.

3.37.2 Notice period for urban tariffs

- For residential supplies, the minimum liability period is 30 days.
- For Businessrate supplies, the minimum liability period is 1 year.
- For Megaflex, Miniflex and Nightsave (Urban) supplies 3 months written notice is applicable.
- The maximum liability period for temporary supplies is the stipulated period that the supply is required for, however notice can be given for the cancellation thereof at any time before the end of that stipulated period.
- The liability period for public lighting supplies is 30 days.
- All fixed network charges are payable for the notice period.

3.38 Transfer of supply

When a supply contract has been terminated and is taken over by a new customer the transfer or reconnection fees as specified in the to the Standard Charges document for the conversion charges. If a supply is taken over any monthly connection charges and/or liability periods still outstanding are transferrable to the contract with the new customer (as the MCC is applicable to the POD and not the customer).
If the supply conditions are changed (tariff change, upgrade or downgrade) and the transfer is genuine, new terms may be applicable (e.g. connection charges, new liability period etc.). Refer to Paragraphs 3.17 and 3.18.

It is important to ensure that a transfer is genuine and not one where a customer has cancelled a supply to avoid paying fixed tariff charges.

A genuine transfer would require:

- Proof of change of ownership.
- Proof of lease agreement.

3.39 Terminated supplies

All supplies terminated by the customer within the contract liability period are considered early terminations.

The customer will be required to pay all fixed network related charges (monthly connection charges where applicable and network charges) for the remainder of the liability period together with any outstanding balance of the ETG where applicable.

A once-off payment should only be levied if it is unlikely that the supply will be taken over. Where the supply is taken over during the term of the original contract period, the original customer must be refunded the pro-rated amount paid by the new customer.

It is important to ensure that a termination is genuine and not one where a customer has temporarily cancelled a supply to avoid paying fixed tariff charges in the normal course of business operations.

The once-off payment is calculated as follows:

Equation 41: Calculation of once off payment due to early termination by the customer

The sum of fixed monthly network charge for the outstanding contract period + any outstanding ETG balance where applicable.
Note: The Service Charge and Administration Charge are not charged because the customer is no longer receiving a service from Eskom. An NPV calculation for the network charge is not used as it is assumed that the price increase and the hurdle rate are the same value.

3.40 Reconnection of terminated supplies for new customers

A standard charge is payable when a supply has been terminated and a reconnection is requested from a new customer who has taken over this supply and wants the supply re-instated.

An inspection of the premise (previously referred to as POD) would usually be required in this case in order to ascertain whether or not any equipment needs to be replaced.

This fee will only apply in cases where no equipment needs to be replaced.

Where any replacement equipment of whatever nature has to be installed in order to re-energise the dormant supply, the fee payable will be the greater of 10% of the standard connection fee OR actual costs of the equipment to be replaced up to a maximum of the connection fee.

Where a new customer requires a terminated point to be re-energised but requires a change in supply capacity the new application may be treated as a request for a new supply. The line allowance was already given for the original rural supply with a full connection fee payable.

Alternatively, the application may be treated as a take-over of the existing supply with a subsequent increase or decrease in capacity with a conversion fee being payable for the change in the supply capacity.

Where a shift of the existing point is requested by the new customer, actual costs of the move of the POD / meter are payable.

3.41 Reconnection of terminated supplies for original customers

Where the same customer who terminated the supply, or any person who is deemed to be acting on behalf of this customer, requests re-energising of the premise, the standard connection fees will be payable irrespective of whether or not the re-instatement date is within the original liability period or outside of this period.

The intention is to discourage seasonal usage customers from repeatedly terminating their supplies and then requesting reconnection simply to evade the fixed monthly charges such as network charges.

- The customer will have to apply as if for a new supply.
- A new/updated deposit will be payable and a new supply agreement will have to be entered into with a new liability period being applicable.
- In cases where the original customer was previously paying a MCC, the MCC amount will again be re-instated. However, the preferred option is that the customer pays the NPV of the MCC amount that was outstanding at the time of termination. Should the upfront payment be unaffordable for the customer then the MCC option must be provided.
- The new monthly connection charge must be calculated based on the PV of the total initial connection charge still outstanding at the time of reconnection together with interest calculated on the MCC amount not paid during the period between the termination and reconnection of the supply.

3.42 Schemes

A scheme is a group of customers (usually rural) that share the total cost equally in making a supply available to them. All customers therefore have the same connection charge based on the average cost per connection and not on the cost to supply an individual customer. These customers have to be in agreement to pay the same connection charge.

Where it may happen that customers do not agree to share the costs equally, the sharing method described in paragraph 3.6.5 should be applied. This will typically happen in smaller schemes.

3.42.1 Calculating SCCs of new schemes

A total connection charge is calculated as if only one connection would be applicable to the total area (scheme). The total scheme connection charge is then divided by the number of customers that have accepted quoted terms to determine the SCC of each customer. For rural tariffs this charge is calculated as follows:

Equation 42: Calculation of Scheme SCC

The total line distance
- The line allowance in metres x by the number of PODS
x NAP line costs per kilometre of line
÷ the number of customers
= Connection charge per customer

3.42.2 Viability of schemes

Viability analysis of new schemes will be based on the number of customers that have accepted the quoted terms.

3.42.3 Scheme minima

No customer connected after the building of the scheme will pay a SCC less than that of the scheme connection charge. The connection charge is based on actual line distance and must be compared to the scheme minimum and the customer will pay the higher of the two.

3.42.4 Non-viable schemes

Where a scheme is not viable due to an insufficient number of customers accepting the quoted terms, a minimum SCC per customer may be recalculated to make the scheme viable. In such a case, the SCC must be recalculated at a later stage as additional customers accept terms and are connected. At a later stage as additional customers are connected, the SCC will recalculated and refunded to the original customers according to the process outlined in paragraph 3.5.

3.42.5 Recalculation of existing scheme SCCs

Where schemes have a minimum SCC applicable this should be recalculated from time to time, where additional customers are connected to the line. If the average line length falls below the line allowance distance, the SCC should be scrapped for all customers on the scheme.

3.43 Obligation to supply and prioritisation of projects

According to the Electricity Regulation Act (Act No. 4 of 2006), a supplier may not delay in providing a supply unduly to an applicant. This means that while it is an acceptable business practice to prioritise supplies based on the amount of capital budgeted and funding approved for, a customer cannot be unfairly refused supply or delayed supply, if for example the supply provides a low return on investment. A low return on investment can be expected on subsidised tariffs.

Projects should ideally be prioritised on a first come first serve basis, but must be in line with Distribution's project prioritisation principles. Refer to the paragraph 3.3 for the approach to be taken when projects are brought forward and there is no approved funding.

3.44 Investment decisions: return on investment analysis

A ROI analysis should not be used to refuse supply to any customer as tariffs are averaged and some tariffs are subsidised by others. This means that the ROI analysis will indicate negative NPVs for all subsidised tariffs.

The investment will be allowed to be included in the rate base provided that Eskom can prove that the investment made has been based on least life-cycle cost investment criteria as described in the **Distribution Network Code** and that the customer has been charged a connection charge that is fair and equitable and in terms of this document and the **Code**.

In terms of the Distribution Code network investment criteria for the cost to be allowable by Nersa in the MYPD process it must be prudently incurred, i.e. is this the least life-cycle cost. Where there are Eskom costs this must be included in the MYPD decision and accommodating in Eskom's budget. This therefore should be the basis for considering whether to go ahead with an investment or not.

3.45 VAT

VAT is payable on all of the above costs, except for Eskom supplies/connections. The customer should be quoted the VAT inclusive and VAT exclusive amount. The VAT exclusive amount is used to calculate any SCC which is used solely for quotation purposes and the total connection charge excluding VAT must be loaded into the billing system.

3.46 Ownership of Eskom connection assets funded by the customer

While a customer may pay for the cost on connection for the Eskom connection works, Eskom will be the owner of the asset. Such assets will be maintained, insured and operated by Eskom.

Eskom will therefore own and operate the Eskom connection works, irrespective of how it was funded by the customer, i.e. through the tariff, through connection charges or through a self-build project. Where a customer wishes to own an asset, such assets will not be part of the Eskom connection works and will be subject to the conditions set out in the following paragraph.

3.47 Own and operate connection assets outside of customer's property

Eskom will not allow customers to own and operate assets in Eskom's Distribution licence area that may potentially be used to supply other customers and/or assets that are constructed on properties other than the property on which the connection is required, unless there are valid reasons to allow this. Ownership of distribution assets means a customer who wishes to own and operate will have to have a distribution licence and therefore Eskom will no longer be the licence holder.

Any application for a customer to own and operate their own assets may require a Distribution Licence and therefore will have to be submitted to Eskom for a decision to support or not support the request as this will impact the technical solution to be provided.

The process is:

- The customer will be informed of the Eskom stance that Eskom will not allow any customer to own and operate distribution assets on land that is not on the customer's property on which the supply is required.
- If an operating unit (OU) believes there are good reasons to allow this, a motivation will have to be submitted to the Eskom for a decision. Such a motivation will need to address all the relevant issues.
- If approved, Eskom will put this in writing for the customer to submit to Nersa in the application of their distribution license. If not approved, Eskom will likewise inform Nersa.
- The customer has the right to appeal to Nersa and any disputes referred to Nersa will be handled as per the normal process.

3.48 Ownership of streetlights

Street lights and other public lighting supplies (such as traffic lights and billboards) become the asset of the customer once the connection charge has been paid fully in circumstances where in the past Eskom provided such funding. Eskom will no longer provide funding for streetlights or similar.

Eskom will, however, own and operate the electricity infrastructure supplying the public lighting supply.

Appendix 1: Capital allowance

(Go back to paragraph 3.4)

1 Capital allowance (applicable to loads only)

The capital allowance is the average amount of capital recovered over a period of time through the tariff rates and is applicable to the connection charge of loads only (shallow boundary approach). The connection charge allocated to the customer is reduced by the capital allowance to ensure that customers don't pay twice for the same network costs i.e. capital included in the tariff.

For the subsidised tariffs the capital allowance forms part of the subsidy funded through the electrification and rural subsidy charge paid by urban customers. The capital allowance is calculated and applied differently for urban, rural and residential tariffs.

The connection charge for generators is not rebated by a capital allowance as upstream costs are not allocated to the connection charge and the network charge for generators is rebatable.

The rules for the capital allowance are:

- The capital allowance if applicable, is subtracted from the allocated connection cost.
- The capital allowance is only applied to the connection charge for loads.
- The capital allowance is subtracted from the total cost allocated to the customer (i.e. dedicated and upstream cost) to calculate the standard connection charge, subject to funding (see paragraph 3.3).
- The capital allowance is not given beyond extinction i.e. will never be greater than the total allocated Distribution costs.
- Capital allowances are not applicable to connection charges for the following:
  - On any actual project costs where funding is not been approved.
  - For electrification projects as the cost of providing supply is funded through the government-electrification programme.
  - For generators as the generator connection charges exclude upstream costs and the network charges are already rebated by loss factors.
  - For premium supplies.
  - To Transmission costs (refer to the Transmission Connection Guidelines for the rules applicable to Transmission costs).
- The capital allowance for rural supplies is based on a line distance and the cost of the transformer. This is a set value based on phase of supply and transformer cost. The line allowance value may differ depending on tariff and phase of supply.
- The capital allowance for urban supplies is based on a R/kVA value differentiated by voltage. This value is based on the average capital included in the tariff charges.
- Where the capital allowance is given, a notice period or early termination guarantee may be applicable.

1.1 Capital allowance for rural tariffs

The capital allowance for rural networks is based on the actual costs of the transformer bank and the line distance allowance and is not based on a calculated value of costs included in the tariff. The capital allowance for rural tariffs is funded from the network charges and subsidies paid for by urban customers.

1.1.1 Rural tariff's line allowance

All rural tariffs will receive a line allowance which will depend on the phase of supply and/or tariff. The line allowance may be applied using distance or a R/value. The value of the line allowance and its equivalent line distance is updated annually. The line allowance as approved, may vary therefore from time to time.

The line capital allowance is given for any line spur built to connect an out-of-line point (transformer), plus upstream sharing. The meter for an out-of-line point (except for Landlight 20A) will be located underneath the transformer bank and not located at any point beyond that. Where due to servitude issues such as a road crossing, Eskom will place the meter on the other side of the road. The service cable is not allowed beyond this point. The allowance is not given beyond extinction.

The line allowance is always taken into account for the purposes of line sharing calculations, even for run-of-line (in-line) points of supply where a reduction/refund on the connection charge is required. See paragraph 3.6.5.

1.1.1.1 Line allowance for Landlight 60A

Landlight 60A will have lower line allowance than Landrate 4 because it is aimed at lower consumption customers and therefore the recovery of the capital in the tariff is reduced and also because it's not possible to make a prepaid supply have a liability period. Rural tariffs, because they receive a large upfront capital allowance that reduce the cost of connection, are required to have a liability period of 60 months to protect Eskom's investment in the event of early termination. In this liability period the outstanding network charges are payable. As Landlight 60A does not have fixed charges, it's not possible to have such a liability period linked to the tariff.

1.1.1.2 Line allowance for Landlight 20A.

Refer to paragraph 1.1.4 for the Landlight 20A line allowance.

1.1.1.3 Line allowance where there is a combination of single or three phase.

Where there is a combination of single and three-phase line used to supply a specific point or where the connection is considered a major works project, then the Rand value method must be used instead of the distance-based method. (Refer also to paragraph 3.27 where a customer requests a change of phase and the line allowance to be used).

1.1.2 Rural tariff's transformer bank or CT/VT allowance

The standard transformation equipment (transformer bank as per the technical standards) and metering costs are considered to be fully recovered through the subsidy and tariff rates (network charges and administration charges).

The rules are:

- For minor work the full transformer bank capital allowance is given.
- For major works a R/kVA value is used to determine the transformer bank capital allowance.
- Where a CT/VT plus metering installation is installed, the cost will be rebated up to the value of the equivalent transformer bank allowance, (including the cost of the metering installation). An additional amount for CT/VT units may be payable by the customer.
- Where a mini-sub is installed and is more expensive than a transformer bank the difference in cost is payable as a premium connection charge.

1.1.3 Rural tariff's transformer bank allowance > 1 MVA

Above 1MVA, the transformer bank allowance is based on a R/kVA value.

Equation 43: Calculation of rural capital allowance for supplies greater than 1MVA

The lesser of the line allowance or actual cost of line.*
+ Transformer allowance
= Total capital allowance

*May vary depending on the phase of supply and/or tariff.

1.1.4 Landlight 20A capital allowance

As it is done for Landrate, the 20A Landlight tariff is a subsidised tariff and has a line and transformer capital allowance. For a typical Landlight connection, it is assumed as a default that there would be at least four customers sharing one 16 kVA transformer and MV line. Therefore the line allowance and transformer allowance based on Landrate 4 is divided by 4.

- The Landlight capital allowance is based on the latest Landrate 4 capital allowance as follows:
  - The transformer allowance divided by the number of customers sharing the transformer.
  - The line allowance by the number of customers sharing the line.

- An LV allowance is also applicable to Landlight based on distance of cable or overhead line.

- Any costs not covered by the capital allowance are payable in addition to the connection fee as a connection charge
- It is advisable to investigate all potential connections in the area to ensure maximum sharing benefit for the new customer(s). If there is the potential that the lines and transformer will be shared, this should be considered upfront when allocating the costs to avoid having to do refunds at a later stage.
- The latest capital allowances are updated annually.

The formula to calculate the connection charge is as follows:

Equation 44: Calculation of Landlight 20A capital allowance

MV line allowance: If actual line length > 600m then line allowance is 150m per customer BUT if actual line length is < 600m then line allowance is the lesser of 150 m or actual line length ÷ number of customers
+ Transformer allowance = NAP cost ÷ minimum of 4 x number of customers sharing
+ LV allowance = maximum distance for overhead service conductor and LV retic network per customer[1]
= Total capital allowance

Each customer must be treated uniquely. The customer who is furthest from the transformer, i.e. customer 3, must be treated differently from the other two customers regarding the sharing of network costs. There are three choices available to the customer i.e. Landlight 20A, Landlight 60A or Landrate.

The customer must consider the following when making a tariff choice; for Landlight 20A there will be a lower connection charge but a higher tariff than Landrate 4 above 350 kWh per month and Landlight 60A is more expensive than Landrate 4 above 500 kWh per month.

Should Customer 3 decide to take supply on the Landlight 20A tariff, the connection charge is calculated as follows (treat as a scheme):

1.2 Capital allowance for urban tariffs

The capital allowance for urban supplies is a R/kVA value differentiated by the voltage of the supply. The capital allowance is provided by Electricity Pricing and is derived as follows:

Equation 45: Derivation of the urban capital allowance

The R/kVA NPV of:
(a) ≥ 66kV ≤ 132 kV voltage category = the cost reflective[1] R/kVA value for Distribution network capital
(b) ≥ 500 kV < 66 kV voltage category = (a) increased by the % difference between the (NCC+ NDC + LV subsidy tariff values[#] for the ≥ 66 kV ≤ 132 kV and the NCC+ NDC tariff values for the ≥ 500 kV < 66 kV voltage categories)
(c) < 500V voltage category = (b) increased by the % difference between the NCC +NDC tariff values[2] for the ≥ 500 kV < 66 kV and the NCC and NDC tariff values for the < 500V category)

[1] From the cost of supply study for the > 66 kV and < 132 kV Distribution network capital costs

[2] The reason for using the tariff values and not the cost-reflective values is because these voltage categories receive subsidies and if based on cost, the capital allowance provided would be too high – would be based on costs and not revenue received through the tariff.

Note that the above formula is not for use in determining the connection charge value – is only used by Electricity Pricing Head Office to determine the capital allowance R/kVA value.

1.2.1 Capital allowance for residential tariffs

For residential tariffs, there is no capital allowance applicable at the time of compiling this document.

1.2.2 Businessrate single phase capital allowance

- Single-phase 16 kVA Businessrate supplies pay a set connection charge where no additional MV or LV work is required and the service connection cable length is within a certain distance for underground cable or overhead LV conductor.
- NAP R/m will be payable for any excess service connection distance.

1.2.3 Public lighting, Businessrate three-phase, Megaflex, Miniflex, Transflex and Nightsave (LPU Urban) capital allowance

- For the above tariffs, the capital allowance is a voltage differentiated R/kVA value, based on the NMD.
- For Transflex, the SNC is based on the simultaneous maximum demand (SMD), but the capital allowance is based on the NMD at each POD (refer also to 3.6.4).
- If the capital allowance is greater than the actual Distribution costs plus SNC, then the connection charge is the minimum connection fee (if there are no Transmission cost).
- Where changes in NMD occur the connection charge must be recalculated and adjusted to reflect the new capital allowance. This includes upgrades and downgrades.

1.3 Self- build capital allowance

For self-build supplies, refer further to paragraph 3.8.8.

1.4 Generator tariff's capital allowance

There is no capital allowance given for connection costs associated with a generator connection for rural or urban supplies as there is already a rebate given on the network charges However, no upstream costs (as defined in Table 1) are payable by generators and no SNC is charged. Where the connection is also a load a capital allowance will apply to the load portion, refer further to paragraph 3.8.7.1.

Appendix 2: Technical considerations for historically above standard supplies (HASS)

Go back to paragraph 3.10.4

1. Executive Summary

In the past Eskom and distribution utilities, such as Municipalities had certain standards and associated designs on how electricity will be supplied to larger customers, typically those taking above 1 MVA and up to many hundreds of MVA. The size of supply, site and associated networks normally determine the end state supply solution. Smaller customers are not impacted as supply methodologies are normally simple and easy to provide- a one size fits all solution.

This annexure outlines the history of how Eskom supplied Large Power User (LPU) customers from a technical viewpoint, which today would not necessarily be the case due to the technical changes that have evolved over the years, and also the financial aspects that need to be considered in terms of the recovery of capital costs and tariff design.

Currently South African utilities are bound to supply power in terms of the **Codes** and associated legislation as developed by the National Energy Regulator of South Africa (Nersa). In this regard Eskom has created a number of enabling policies which ensure compliance in terms of the relevant codes of practice.

The important factor in the provision of new and upgraded supplies is the concept of least life-cycle costs as outlined in the investment criteria from the **Codes**, which utilities must apply. Supplies satisfying the least life-cycle cost scenario are referred to as standard supplies and any requirement above that as premium supplies (PS), for which costs must be recovered from the end user.

The brochure aims at enlightening readers as to the requirements of the **Codes** and the associated policies and standards Eskom will apply so as to ensure compliance to these **Codes.**

2. A background to electricity supplies in Eskom

Supplies of electricity are typically determined by the following:

- The NMD as required by the customer. This is the demand notified by the customer of which Eskom accepts and is contractually obliged to supply.
- Size of equipment needed to be installed to cater for the current and future NMD, typically transformers.
- The voltage at which supply is needed.
- The site where the supply is situated.
- The supporting backbone Distribution and Transmission networks.
- The number of points of connection required to cater for the current and future NMD. These are typically called Points of Measurement (POM) or meter panels (MP)

Refer also to the definition of a standard supply and a premium supply.

Historically technology available at the time played a major role in defining the technical solution in providing customers with electricity. In the 1940's supply were sometimes satisfied by numerous transformers installed in substations, sometimes in the order of 12-16 in one high voltage (HV) yard ranging from 2,5 to 5 MVA in rating. Only more recently were larger units manufactured and typically for higher MVA power requirements, 10, 20 and 40 MVA units are now installed- these being standard sizes (Note: Eskom does not order 15, 25 or 30 MVA transformers although such sizes are still in operation).

The installation of a surplus of assets over and above those needed to satisfy the NMD was aided by very favourable financial terms for customers due to a rebate system within the tariff mechanism in place at the time. In quite a few instances Eskom typically always installed assets to satisfy N-1 contingencies (surplus transformers mainly). Customers were also provided meter panels in excess of what would be provided now. This came about at initial meetings and all project costs (standard and premium portions) were converted into connection fees and monthly account charges (Monthly Rentals- MR).

It was common practice in the 70's and 80's to install further transformers once the load at a substation reached 70-80% of installed capacity.

In effect historically above standard supplies (HASS) were created for the above reasons.

In the 1990's the practice of creating HASS's was phased out when the concept of "base case" supplies (now standard supplies) was the due consideration technically. This was based on providing customers with only that what was necessary to satisfy the NMD. For new customers this was single lines (radial feeds), transformers and meter panels. For multi transformer supplies only those required to satisfy the NMD were installed. The concept of radial feeders (a single line or cable supply) is in most cases not a technically sound solution so multiple line in feeds resulted. The base case terminology is effectively the same as the least life-cycle cost solution currently applied.

Current Status: Current planning and pricing practice aligns with least life-cycle cost technological requirements needed to provide an adequate supply as specified in the **Distribution Network Code**- these supplies are known as standard supplies. Any additional infrastructure required by customers (such as additional standby transformers) are known as premium supplies/assets which Eskom now identifies and contracts for.

Note: Customers would need to fund the provision of premium supplies over and above the funding requirements as required for the standard supply.

3 Current codes of practice and standards

The following legislation, regulations, codes of practice, standards are important documents outlining the requirements of utilities in making supplies of electricity available:

Note: Only the applicable clauses to the subject have been outlined in this document.

4 . Electricity Regulation Amendment Act 28 of 2007

The following clauses (*in italics*) are applicable in this instance and can be seen to be the source upon which all associated Codes of practice and standards are based.

2. Objectives of Act

The objectives of the Act are to-

a) achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;

b) ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic;

g) facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public.

14. Conditions of licence

(1) The Regulator may make any licence subject to conditions relating to -

t) compliance with any regulation, rule or code made under this Act;

15. Tariff principles

(1)A licence condition determined under section 14 relating to the setting or approval of prices, charges and tariffs and the regulation of revenues -

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

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

5. South African Distribution Code: Network Code (Version 6.0)

The following clauses (*in italics*) are applicable in this instance and can be seen to be the source upon which all associated Guidelines and Standards are based.

7.2 Network Investment Criteria

7.2.1 Introduction

(1) Distribution tariffs should be sufficient to allow the necessary investments in the networks to be carried out in a manner allowing these investments to ensure the viability of the networks.

(2) The Distributor shall invest in the Distribution System when the required development meets the technical and investment criteria specified in this section.

(3) The need to invest must first be decided on technical grounds. All investments must be the least lifecycle cost technically acceptable solution, that is, shall provide for standard supply:

(a) Minimum quality requirements in terms of NRS 048.
(b) Minimum reliability and operational requirements as determined by this code and by the Nersa.

(4) The investment choice must be justified by considering technical alternatives on a least- life-cycle cost approach. Least life-cycle cost is the discounted least cost option over the lifetime of the equipment, taking into account the technical alternatives for investment, operating expenses and maintenance.

(5) Calculations to justify investment shall assume a typical project life expectancy of 25 years, except where otherwise dictated by plant life or project life expectancy.

(6) The following key economic and financial parameters shall be determined by a Nersa approved process:

(a) Discount rate
(b) Customer interruption cost (cost of unserved energy)
(c) Other parameters, such as tariffs and additional economic parameters.

7.2.2 General Investment Criteria

(1) Investments should be prudent (that is justified) as a least life-cycle cost solution after taking into account, where applicable, alternatives that consider the following:

(a) The investment that will minimise the cost of the energy supplied and the customer interruption cost (cost of unserved energy).
(b) Current and projected demand on the network.
(c) Reduction of life-cycle costs e.g. reduction of technical losses, operating and maintenance costs and telecommunication projects
(d) Current condition of assets and refurbishment and maintenance requirements.
(e) Demand and supply options.
(f) Any associated risks.

(2) General (shared) network investments shall be evaluated on the least-life-cycle economic cost. Economic cost will consider the least life-cycle total cost of the electricity related investment to both the Distributor and the customer.

(3) Investments made by the Distributor dedicated to a particular customer shall be evaluated on a least life-cycle Distributor cost. Distributor cost will consider only the least life-cycle investment cost to the Distributor.

(4) The Distributor shall evaluate investments in terms of the following categories:

(a) Shared network investments
(b) Dedicated customer connections.
(c) Statutory investments.
(d) International connections (cross-border connections)

7.2.3 Least economic cost criteria for shared network investments

(1) Shared network investments are:

(a) Investments on shared infrastructure (not-dedicated) assets.

(b) Investments required to provide adequate upstream network capacity.
(c) Investments required to maintain or enhance supply reliability and/or quality to attain the limits or targets, determined in section 6.2 of this code, on existing network assets.
(d) Refurbishment of existing standard dedicated connection assets.

(2) All shared network investments are to be justified on least economic cost. In determining the least economic cost for shared network investments the investment must be justified to minimise the cost to the electricity industry and not just to the Distributor.

7.2.4 Least life-cycle cost criteria for standard dedicated customer connections

(1) A standard connection is defined as the lowest life-cycle costs for a technically acceptable solution and will be charged for as described in the Section 11.1 in the Tariff Code.

(2) Dedicated customer connections are:
(a) New connection assets created for the sole use of a customer to meet the customer's technical specifications.
(b) Dedicated assets are assets that are unlikely to be shared in the distributor's planning horizon by any other end-use customer.

(3) All dedicated connection investments are to be justified on the technically acceptable least life-cycle costs.

(4) Where the investment meets the least life-cycle cost, the customer shall be required to pay a standard connection charge as described in the Tariff Code.

(4) Where the investment meets the least life-cycle cost, the customer shall be required to pay a standard connection charge as described in the Tariff Code.

(5) For certain customer groupings, as approved by the Nersa, the investments shall be justified collectively as per customer grouping and not per customer.

(6) The Distributor will refurbish / replace / reconfigure all equipment in terms of its new standards to meet standard supply criteria at no cost to the customer and this will allowed to be recovered in the use-of- system (network charges). This will be a non-discriminatory approach where no consideration will be given to the special or unique requirements of the customer.

7.2.5 Investment criteria for premium customer connections

(1) The Distributor shall investigate these additional requirements and will provide a least life-cycle cost solution.

(2) If the customer agrees to the solution, all costs to meet the customer requirement in excess of what is considered the least life-cycle cost investment is payable as a premium connection charge by the customer as described in section 11.2 of the Tariff Code. Such costs shall be appropriately pro-rated, if a portion of the investment can be justified based on improved reliability or reduction of costs.

(3) The refurbishment of identified premium connection assets will occur when the equipment is no longer reliable or safe for operation. The Distributor must justify the need for refurbishment of the premium assets to the customer, and the customer must agree to the continuance of the premium supply.

(4) At the time of refurbishment, should the customer have any requirements that cannot be met in terms of the 7.2.4 (5), any additional investment will be seen as a premium connection.

(5) Where the refurbishment of a supply in accordance with current technical standards will result in additional cost to the customer, an engineering solution that minimises the sum of the Distributor's and the customer's costs will be found. This least economic cost option will be implemented but any expenditure in excess of the Distributor least life-cycle cost solution (as per 7.2.2 and 7.2.4 (5) above) will borne by the customer through a new premium connection charge and shall not be recovered through use-of-system (network) charges

6. Distribution Guide- Part 1: Network Planning Reliability Guideline

This guideline is used primarily by Eskom network planners as a source upon which all customer applications, engineering proposals, cost estimate letters and customer quotations are based.

The guideline makes certain technical evaluations and recommendations (especially covering redundancy, need for firm supplies, etc) however in terms of cost recovery for customer projects and supplies this document- Connection Charges for Customers Connected to Eskom's Distribution Network must be referred to.

Effectively Eskom will adopt the standard supply approach for all applications (for new and existing supplies) and on request will offer premium supply solutions, payable for by customers.

7. Management of Historically above standard supplies (HASS)

A standard supply is typically a supply based on least life-cycle costs and in most instances is one where there is also a "least asset/s" solution. Least assets typically equate to least capital and thus also minimised operational and maintenance costs. Effectively supplies are made up of all or some of the following components:

- Power transformers
- Overhead lines or cables
- Medium Voltage (MV) Breakers as part of switchboards or on their own
- Meter Panels (MP'S).

Note: A meter panel technically is a point at which a customer connects to the Eskom system to take supply (i.e. from a circuit breaker or isolator, etc). It is also equipped with tariff metering.

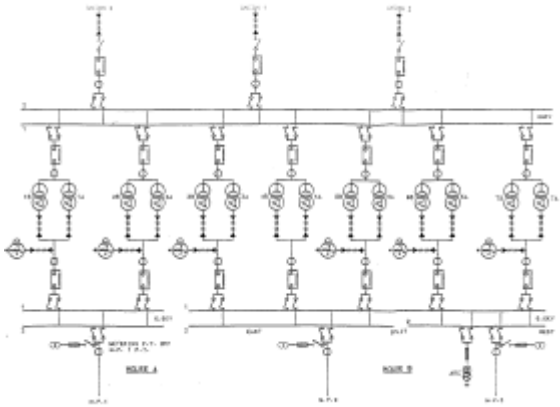
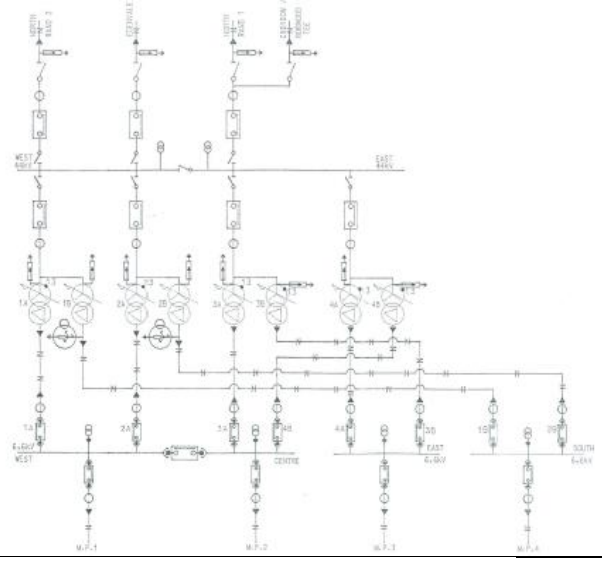
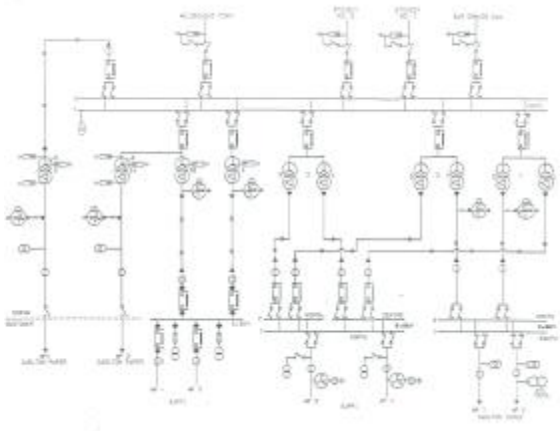
Thus from a HASS viewpoint it can be about excesses of all or some of transformers, meter panels, lines and cables.

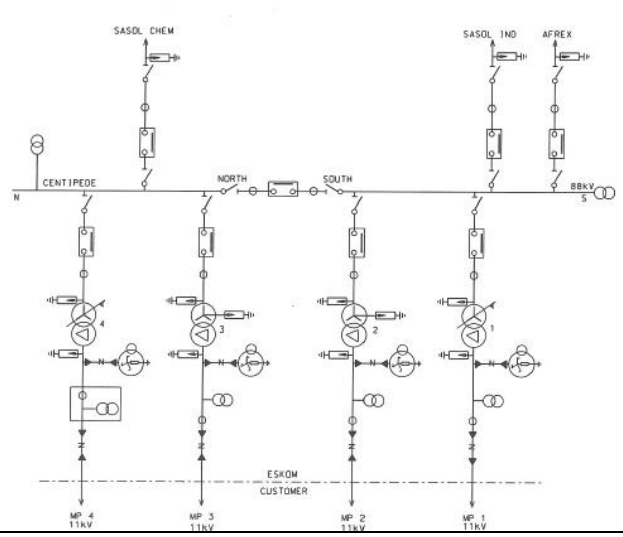
The following are actual examples of HASS with comments per supply should there be a need for refurbishment or replacement.

Note:

- The proposed standard supply solution per example may not be the only solution if replacement had to take place.
- The standard supply solution ignores the incoming line or cable criteria as this can be impacted by the network arrangement specific to that supply.

Examples of HASS Supplies

Supply	Comments
	**Customer A substation** **Age:** Built in the 1940's. **Capacity:** = 35 MVA (14 x 2,5 MVA transformers) **NMD:** 28 MVA **Meter Panels (MP):** 3 **Standard supply solution:** 2 x 20 MVA transformers; 2 x MP's
	**Customer B substation** **Age:** Old substation built in the 1960's. **Capacity:** 40 MVA (8 x 5 MVA transformers) **NMD:** 33 MVA **MP's:** 4 **Standard supply solution:** 2 x 20 MVA transformers; 2 x MP's
	**Customer C and D substation** **Age:** Very old substation built in the 1940's. **Supplies 2 x customers:** **Capacity:** **Customer C:** 40 MVA (4 x 5 MVA; 2 x 10 MVA) **Customer D:** 30 MVA (2 x 5 MVA; 2 x 10 MVA) **NMD:** **Customer C:** 22 MVA **Customer D:** 14 MVA **MP's:** 4 each **Standard supply solution:** **Customer C:** 2 x 20 MVA transformers; 2 x MP's **Customer D**: 1 x 20 MVA transformer; 1 x MP's

	**Customer E substation** **Age:** Substation originally built in the 1950's. **Capacity:** 90 MVA (2 x 25 MVA; 2 x 20 MVA) **NMD:** 36 MVA **MP's:** 4 **Standard supply solution:** 2 x 20 MVA transformers; 2 x MP's

5 Refurbishment clauses applicable to HASS in the Eskom contracts

The following clauses in the pro-forma of Eskom Electricity Supply Agreement, (*in italics*) relate to conditions and remedy thereof when there is a need for refurbishment or replacement of equipment.

27. REFURBISHMENT AND OR REPLACEMENT OF ESKOM EQUIPMENT

27.1ESKOM shall refurbish (which, for this purpose, does not include maintenance or repairs conducted in the ordinary course of ESKOM's business) or replace the equipment referred to in clause 23 (Equipment to be Supplied by ESKOM) when it becomes necessary for technical and or safety reasons in accordance with the network investment criteria set out in the Code(s). Technical reasons may include compliance with the Code(s) and/or compliance with the provisions of Annexure '…' (Quality of Supply).

27.2The Parties acknowledge that due to advancements and technical improvements in electrical equipment, unavailability of certain equipment and other technological changes, exact replication of the existing supply arrangement(s) and equipment, on the existing site(s), as installed at the time of first connecting the supply to the CUSTOMER, may not be possible or may not be in accordance with ESKOM's standards to meet the standard supply criteria, applicable at the time.

27.3The Parties further acknowledge that different types of equipment have different operational and/or useful life-cycles and that refurbishment or replacement may take place at different intervals in accordance with and subject to sub-clauses 27.1, 27.2, 27.4 and 27.5.

27.4Should it not be possible to meet the CUSTOMER's requirements, at the time of refurbishment or replacement, with the equipment allowed for in terms of the Distribution Code for a Standard Connection, any additional equipment shall be deemed to be Premium Equipment. The CUSTOMER shall pay a Premium Connection Charge in respect of the costs associated with any equipment identified as Premium Equipment at the time of refurbishment or replacement.

27.5If the equipment to be refurbished or replaced is identified as Premium Equipment in terms of the Distribution Code criteria, or provides the CUSTOMER with a Premium Connection Condition, ESKOM shall notify the CUSTOMER in writing thereof giving details of the technical and financial implications to the CUSTOMER (including details of the replacement and/or refurbishment work that has to be carried out, how the quality and continuity of supply will be affected if the replacement and/or refurbishment is not effected, the estimated capital expenditure and costs involved and the estimated Premium Connection Charge to be paid by the CUSTOMER). If the CUSTOMER however disputes in writing the criteria used or the amount of the estimated Premium Connection Charge, for the replacement and/or refurbishment work associated with the Premium Equipment, such disputes shall be settled in accordance with clause (……Dispute and Dispute Resolution clause….).