

REGULATORY RULES ON NETWORK CHARGES FOR THIRD-PARTY TRANSPORTATION OF ENERGY

MARCH 2012

EXPLANATORY MEMORANDUM

The provisions of the Electricity Regulation Act (Act No. 4 of 2006) ('the Act') authorise the Energy Regulator to prepare and pass rules designed to implement the national government's electricity policy framework, the integrated resource plan and the Act. The provisions of the Act further states that non-discriminatory access to the networks must be provided on conditions relating to:

- (a) *the circumstances under which access must be allowed;*
- (b) *the circumstances under which access may be refused;*
- (c) *the strengthening or upgrading of the transmission or distribution power system in order to provide for access, including contributions towards such upgrading by the potential users of such systems, if applicable;*
- (d) *the rights and obligations of other existing or new users regarding the use of such power systems;*
- (e) *compliance with any rule, code or practice made by the Regulator; or*
- (f) *the fees that may be charged by a licensee for the use of such power system.*

TABLE OF CONTENTS

DEFINITIONS.....	4
ABBREVIATIONS AND ACRONYMS	8
1 Introduction.....	9
2 Legal Basis.....	10
3 Objectives	10
4 Geographic Differentiation	12
5 Rural and Urban Reticulation Networks.....	13
6 General Use-of-System Charges Principles.....	13
7 Network Charges	14
8 Reliability Service Charge	15
9 Service and Administration Charge	16
10 Losses Charge	16
11 Connection Charges	17
12 Wheeling Arrangement.....	18
13 Bypass of Distribution Network Services.....	19
14 Subsidy Contributions.....	20
15 Reconciliation of Accounts.....	20

DEFINITIONS

Administration charge	The administration charge covers the costs of the administration of the account. It is a contribution towards fixed costs such as meter reading, billing and meter capital. It is a fixed charge payable every month whether electricity is consumed or not.
Connection charge	The connection charge is the charge allocated to the customer for the capital costs of new or additional capacity (irrespective of whether new investment is required or not) that is not covered by the tariff. It is payable in addition to the tariff charges as an up-front payment or as a monthly connection charge where the distributor finances the connection charge.
Consumption	The energy used by a customer during a specific period, measured in kWh.
Distribution charges	The charges applicable for the use of the distribution system (DUOS charges) and the connection to the system (connection charges).
Distribution system	The distribution system transports power to users at voltages of <132kV as defined in the SA Grid Code.
Distribution use-of-system charges	DUOS charges are unbundled regulated tariffs charged for making capacity available on the distribution system to contestable and indirect customers. DUOS charges comprise unbundled DUOS network charges, embedded TUOS charges, charges for energy losses – for both distribution and transmission losses, reactive energy charges and levies to recover subsidies.

- Distributor** A regulated business that constructs operates and maintains the distribution system. The distribution business will also purchase transmission network services and may provide retail services such as purchasing of energy and meter reading, billing, customer service etc.
- Embedded TUOS charges** The distributor must adjust the TUOS charges to take into account the diversified demand of the embedded distribution customers. If the undiversified demand were used, this would result in the receipt of more revenue by the distributor for transmission costs than the actual cost to the distributor for this service. The adjustment of the TUOS charges as charged by the transmission network company is the embedded TUOS charges.
- Network charges** The network charge is a tariff charge payable per premise every month. The network charge recovers network costs (including capital, operations, maintenance and refurbishment) associated with the provision of the network capacity required and reserved by the customer. The network charge in the retail tariff or in the DUOS charges may or may not be the same as in structure and value.
- Network demand charges (NDC)** The network demand charge is a tariff component that may be applicable to both the structure of retail tariffs and to DUOS. It is a charge that is variable on a monthly basis and is charged on the actual demand measured in peak and standard periods.

Notified maximum demand (NMD)	The notified maximum demand (NMD) is the maximum demand notified in writing by the customer and accepted by the distributor, that the customer requires the distributor to be in a position to supply on demand during all time periods. It is normally the capacity reserved by the distributor for a customer in the short term, i.e. the following year, and includes contingency capacity.
Reliability Service Charge	The charge for services provided by NSP to ensure the short-term reliability of supply to customers.
Premium supply	Where the customer's specifications result in equipment to be installed above the least economic cost requirements needed to provide an adequate supply and where the customer specifically contracts for a premium supply. (See also standard supply.)
Service charge	The service charge is the fixed charge payable every month. It is a contribution towards service-related costs, e.g. customer service costs.
Tariff	A tariff is a combination of charging parameters applied to recover measured quantities such as consumption and capacity costs, as well as unmeasured quantities such as service costs.
Technical losses	Losses incurred over electrical networks due to the characteristics of the physical equipment usually associated with dissipation.
Transmission system	All lines and substation equipment where the nominal voltage is above 132kV.

Transmission use-of-system charges

The regulated tariff charged for the use of the transmission system which includes network, reliability, losses and/or service and administration charges.

WEPS

A totally unbundled cost-reflective tariff structure comprising energy rates, levies, service and administration charges, transmission network charges, loss factors, reliability service charges and distribution network charges.

ABBREVIATIONS AND ACRONYMS

DoE	Department of Energy
DUOS	Distribution use-of-system charges
Dx	Distribution
EPP	Electricity Pricing Policy
ERA	Electricity Regulation Act
ESI	Electricity Supply Industry
IBT	Inclining Block Tariff
IPP	Independent Power Producer
ISMO	Independent System Market Operator
KVA	Kilovolt Ampere
kW	Kilowatt
MV	Medium Voltage (11kV – 66kV)
NAC	Network Access Charge
NERSA	National Energy Regulator of South Africa
NMD	Notified maximum demand
NSP	Network Service Provider
O&M	Operating and Maintenance
RS	Reliability services
SNC	Shared Network Service
SO	System Operator
TOU	Time-of-Use
TUOS	Transmission use-of-system charges
Tx	Transmission
UOS	Use-of-system charges
WEPS	Wholesale Electricity Pricing System

1 Introduction

The Electricity Regulation Act, 2006 (Act No. 40 of 2006) requires that the transmission, distribution and trading function of electricity supply be separately licensed and that the transmission or distribution function shall provide non-discriminatory network access to all users of the transmission or distribution system.

The Electricity Regulations on New Generation Capacity document dated 04 May 2011 ('the Regulations') provides the framework for the procurement of new generation capacity. These regulations are only applicable to the procurement of new generation capacity by organs of state and not for wheeling arrangements. Regardless, the pricing of connection and access to the networks are considerations that have to be resolved to give effect to power purchase contracting since the Sellers of the new generation capacity under the Regulations are third-party renewable generators.

The requirement to issue Independent Power Producers (IPPs) and renewable energy generators with guidelines on the costs involved in network access and transportation of electricity necessitates the provision of principles, rules and methodologies to facilitate transmission and distribution system access. A connection agreement or wheeling agreement, where applicable, should be entered into by the generator and the Network Provider for the purpose of regulating the connection to and use of the network system. Use-of-system (UOS) charges are tariff structures and rates that recover the costs associated with making capacity available on an electricity network. These charges are the unbundled regulated tariffs, charged by the Network Services Provider (NSP) for making transmission or distribution capacity available to the generators and other distributors. The application of UOS tariffs allows for the recovery of the fixed and Operation and Maintenance (O&M) costs, recovery of transmission losses as well as costs for ancillary services procured by the System Operator. These UOS charges do not recover connection charges, which should be charged separately.

2 Legal Basis

The legal basis for the Regulatory Rules on the Network Charges for third-party transportation of energy lies in the Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act'). Section 4 (a)(ii) of the Act states that 'the Regulator must regulate prices and tariffs'. Further, section 16 (1) and (2) of the Act prescribes the following tariff principles:

- (1) *A license condition determined under section 15 relating to 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 the continued improvement of the technical and economic efficiency with which the services are to be provided;*
 - c) *Must give end users proper information regarding the costs that their consumption imposes on the licensee's business;*
 - d) *Must avoid undue discrimination between customer categories; and may permit the cross subsidy of tariffs to certain classes of customers.*
- (2) *A licensee may not charge a customer any other tariff and make use of provisions in agreements other than that determined or approved by the Regulator as part of its licensing conditions.*

Apart from the Act, the Electricity Pricing Policy (*Electricity Pricing Policy GN 1398 of 19 December 2008*), gives broad guidelines to the National Energy Regulator of South Africa (NERSA or 'the Energy Regulator') in approving prices and tariffs for the electricity supply industry.

3 Objectives

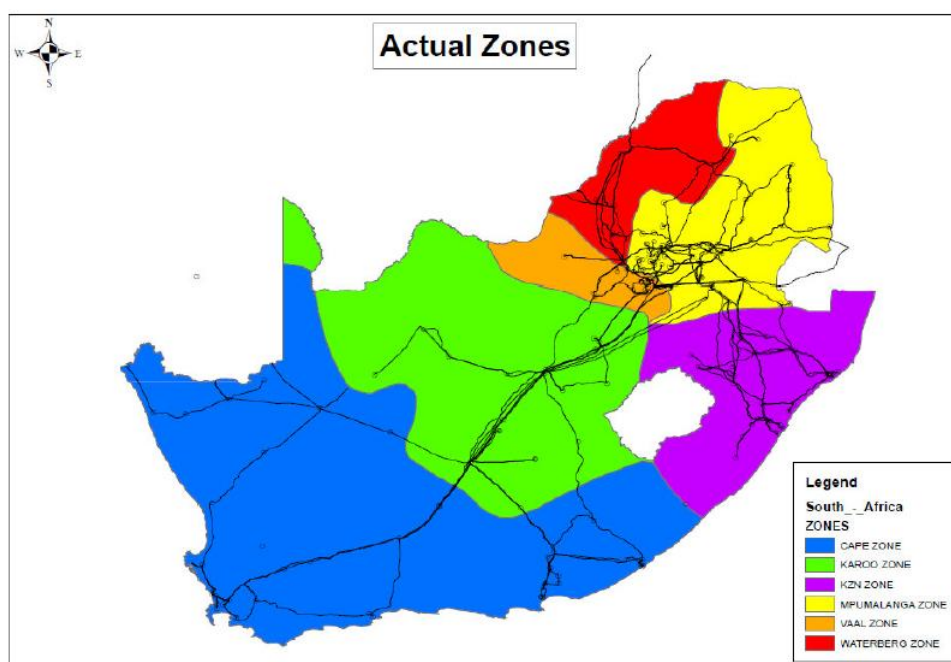
The objectives of the UOS charges are:

- **Promotion of economic efficiency:** The central objective of an efficient network-pricing regime is the promotion of efficiency in the use, operation of and investment in the network, so that costs are minimised in the long run.
- **Promotion of non-discriminatory access:** The ability of customers to contract independently with independent power producers and non-discriminatory access to and use of the transmission and distribution networks to generators should be promoted.
- **Cost reflectivity:** Prices should reflect the cost of providing a service as far as possible based on the relative utilisation of the networks.
- **Non-discrimination:** The same electricity network price should apply to all users of the network and be related to the utilisation of the networks.
- **Transparency:** It should be clear to users how network prices are determined.
- **Revenue recovery of service providers:** The revenues recovered through the charges should be sufficient to sustain the transmission and distribution businesses and allow for appropriate expansion of the networks.
- **Affordability:** The cost of these services should be affordable to the majority of users and potential users.
- **Uniformity, simplicity and predictability:** Prices should be simple, transparent and readily understood. Many tariff components shall be avoided and the number of discretionary rulings shall be minimised. Customers shall also be protected from unusually large fluctuations in charges.

4 Geographic Differentiation

- 4.1 All UOS charges shall be designed based on these regulatory rules with geographic and voltage differentiation unique to the Network Provider.
- 4.2 Geographic differentiation based on location within an area of a licensee shall be applied for supplies associated with lower density.
- 4.3 A six (6) zone geographical differentiation outlined in **Figure 1** shall be used for Transmission connected generators.

Figure 1: Six Generation Transmission use-of-system (TUOS) zones



- 4.4 The Transmission network costs for loads shall be allocated to each customer segment based on a 0% to 3% price differential illustrated in **Table 1**.

Table 1: Geographical differentiation for Transmission load customers

Transmission Distance from Johannesburg	Zone	% Price Differential or Surcharge
0 – 300 km	0	0%
301 – 600 km	1	1%
601 – 900 km	2	2%
> 900 km	3	3%

5 Rural and Urban Reticulation Networks

- 5.1 Cost of supply studies shall be undertaken featuring pooling strategies which separate significant groups of customers that differ considerably in density from other customers. Network charges shall be allocated based on these cost of supply studies.

6 General Use-of-System Charges Principles

- 6.1 UOS charges shall recover the costs associated with making capacity available on an electricity network and these UOS charges do not recover connection charges, which shall be charged separately.
- 6.2 UOS charges shall be independent of the commercial trading arrangements.
- 6.3 Charges for access to the system shall be collected from the users at their point of connection to the system.
- 6.4 The costs for recovery of Transmission losses and procurement of ancillary services shall be charged out to loads (including power exports) and generators (including power imports) using the Transmission use-of-system (TUOS) charge.
- 6.5 Distribution Service Providers shall recover the costs of losses using the Distribution use-of-system (DUOS) charge.
- 6.6 The DUOS losses charge component shall signal the marginal cost of network usage through Distribution Loss Factors.
- 6.7 Any load customer shall be free to go into bilateral arrangements with any third-party generator, i.e. non-Municipal and non-Eskom generator.
- 6.8 The Distribution Services Provider shall charge retailers and other entities operating under a trading licence for each of the connection points used for trading and such retailing entities shall recover the DUOS charges through their retail tariffs.
- 6.9 The retailer shall be required to show the DUOS charge as a separate charge in the end user account.
- 6.10 Generators generating electricity within the requirements of the Regulations shall be required to pay the regulated UOS charges and shall be permitted to

recover the paid UOS charges from the Buyer through supplemental pass-through payments.

- 6.11 The UOS charge for generators shall be fixed at wheeling agreement signature date and shall be indexed to the Consumer Price Index (CPI) annually at the end of March, starting the year following the signature date and each year thereafter.
- 6.12 The annual increase of UOS charges for loads shall be based on the Transmission increase component of the average tariff increase announced by NERSA during licensee tariff increase applications.

7 Network Charges

Transmission network charge for loads

- 7.1 Transmission network charges for loads shall be charged, in R/kVA per month, based on the greater of the customer's notified maximum demand (NMD) or the actual recorded maximum demand over the preceding 12 months with a surcharge differentiated into four zones based on the distance of the load in kilometres from Johannesburg as shown in **Table 1**.
- 7.2 The Transmission network charge for loads shall be calculated such that 50% of the network cost of the Transmission network service provider is recovered by applying the charge including the surcharge.

Transmission network charge for generators

- 7.3 The Transmission network charge for generators shall be charged in R/MW per month, based on the installed MW sent out capacity, to recover the remaining 50% of the cost of the transmission network service provider.
- 7.4 The Transmission network charge for generators shall be differentiated into six tariff zones based on the concentration of power generation in South Africa as shown in **Figure 1**.
- 7.5 All generators in zones with negative network charges shall have their network charge rates set to zero.

DUOS network charges component for loads

- 7.6 The DUOS network charges shall be differentiated according to the distributor's voltage and topographical (rural/urban) categories determined by each distributor, based on a logical and justifiable categorisation that avoids unnecessary cross-subsidisation between customers.
- 7.7 The DUOS network charge shall be based on the cost per kVA demand determined using notified annual maximum demand (NMD).
- 7.8 The DUOS network charge for loads shall be split into DUOS network access and DUOS network demand charges.
- 7.9 The DUOS network access charge shall be in R/kVA and based on the highest utilised capacity (highest of actual demand over 12-month period and NMD).
- 7.10 The DUOS network demand charge shall be based on the highest demand measured in a billing period and may be time differentiated, where applicable.

Network Charges (DUOS Generators)

- 7.11 Generators connected at Medium Voltage level (11kV to 33kV) shall be assumed to be embedded in demand dominated nodes and shall be exempted from paying DUOS network charges.
- 7.12 Generators connected at High Voltage (66kV to 132kV) shall pay a network charge calculated as for loads and converted to a R/kW charge less a network charge rebate based on the benefit of losses.
- 7.13 The network charge for HV connected generators shall be a fixed amount based on the maximum generator export capacity and not split into an access and a demand charge.

8 Reliability Service Charge

- 8.1 All loads and generators, including Medium Voltage (MV) connected generators, shall be charged for reliability services based on the total energy exported or consumed into/from the network.

9 Service and Administration Charge

9.1 Service and Administration charges shall be independent of network operations or installed capacity and shall be raised from both loads and generators for recovery of costs associated with billing, meter reading and customer support.

10 Losses Charge

TUOS losses charges

10.1 All loads or generators connected directly to the Transmission network shall be charged for losses according to the Wholesale Electricity Pricing System (WEPS) energy rate.

10.2 Cross-border energy shall be compensated for losses up to the South African border.

10.3 The cost of losses shall be charged based on calculated average loss factors for all loads and generators.

10.4 The Transmission loss factors for loads shall be calculated for the 0% to 3% geographic differentiation and the loss factors for generators are calculated for the six generator zones.

10.5 Cost of TUOS losses shall be calculated as follows:

$$\text{Cost of TUOS Losses} = \sum \{\text{Delivered energy}_t \times (\text{Transmission loss factor} - 1)\} \times P_t$$

Where t = the appropriate peak and
 P_t = WEPS energy rate.

10.6 The loss factors change as the transmission system develops, as new generators and loads are added to the transmission system, and shall be updated after major transmission system developments.

DUOS Losses charges for loads

- 10.7 The cost of electrical losses shall be recovered as a function of the appropriate loss factors for the relevant voltage level and the distributor's cost of energy purchases on a time-of-use basis.
- 10.8 The loss factors shall be differentiated according to the distributor's voltage and geographic categories.
- 10.9 The distributor shall be responsible for all losses flowing through its system and shall recover these costs from all loads connected to its system as part of the DUOS charge.
- 10.10 Losses shall be priced at the wholesale electricity purchase price that the distributor is charged for losses incurred.
- 10.11 Cost of DUOS losses shall be calculated as follows:

$$\text{Cost of DUOS Losses} = \sum \{ \text{Delivered energy}_t \times (\text{Distribution loss factor} \times \text{Transmission loss factor} - 1) \times P_t \}$$

Where t = the appropriate peak and
 P_t = Purchase energy price

DUOS Losses charges for generators

- 10.12 The DUOS charges for an embedded generator shall take into account the generator's impact on the distribution losses.
- 10.13 In the case of co-generators that are both importers and exporters of energy, the network charges applicable to loads shall apply to the net load imposed on the distribution network.

11 Connection Charges**Transmission connection charges**

- 11.1 Transmission connection charges shall be payable upfront and shall be based on customer (load or generator) specific costs, i.e. dedicated costs incurred for the benefit of the customer.
- 11.2 In the event where more customers connect at the same point, where assets were previously determined to be customer specific and were paid for through a connection agreement, the new customer(s) shall be charged

for the use of such assets on a *pro-rata* basis compared with the original customer. The original customer shall then receive a rebate based on the payment of the new customer(s).

- 11.3 Upstream reinforcements costs shall not be raised from wheeling generators but an early termination guarantee for shared assets, i.e. upstream reinforcements, shall be raised.
- 11.4 The early termination guarantee shall be not higher than 50% of the fair share of the upstream reinforcement costs and shall decrease by 1/10th (one tenth) per year, starting four (4) years after the date of connection.

Distribution connection charges for generators

- 11.5 Connection charges for Distribution connected generators shall be payable upfront and shall be raised as for loads where there is export onto the network, i.e. dedicated costs plus a shared network cost (SNC) based on export capacity.
- 11.6 A standard supply option shall be provided and any additional costs, dedicated or upstream, to accommodate above-standard customer requirements shall be for the customer's account.
- 11.7 No capital allowance shall be given while no UOS network charges are raised.
- 11.8 All actual upstream shared costs shall be recovered in the rate base, but an early termination guarantee for shared assets, i.e. upstream reinforcements, shall be raised.
- 11.9 The early termination guarantee shall not be higher than 50% of the fair share of the upstream reinforcement costs and shall decrease by 1/10th (one tenth) per year, starting four (4) years after the date of connection.

12 Wheeling Arrangement

- 12.1 Wheeling of energy shall be allowed, subject to the generator receiving its approvals from NERSA to sell to a third party and the signing of the network service provider's Connection and Use-of-System Agreement.

- 12.2 Generators connected at below 11kV shall not be allowed to wheel energy.
- 12.3 Only non-Eskom generators may enter into wheeling arrangements for the sale of energy to a consumer who may be an existing Eskom load customer or a new load customer.
- 12.4 Cross-border wheeling should be treated in terms of the South African Power Pool (SAPP) rules between operating members and charges for incremental losses incurred as a result should also be treated according to these SAPP rules.
- 12.5 Imports of wheeled energy for use by South African consumers should be treated as a generator, whereas exports from a South African wheeling generator to a consumer across the border should be treated as a load.
- 12.6 UOS charges for wheeled energy imports or exports should be raised at the relevant Transmission station where the imports or exports take place.
- 12.7 An end-customer supplied through inter-distributor wheeling should be required to pay the DUOS charges of the last distributor, for avoidance of doubt the last distributor means the immediate distributor that the end-customer is connected to.
- 12.8 If a network operator's performance drops below the 98% and 95% availability limits for Transmission and Distribution Systems, respectively, then the network operators should compensate the generator for energy that could have been exported into the system at WEPS rate.
- 12.9 In the event of network unavailability, UOS charges should not be raised from generators.
- 12.10 The 300MW embedded generator capacity limit shall be applicable as an interim arrangement until a supply and demand balancing mechanism is implemented by an independent system operator.

13 Bypass of Distribution Network Services

- 13.1 Uneconomic bypass of distribution services shall be addressed on a case-by-case basis to be approved by NERSA.

14 Subsidy Contributions

14.1 Eskom shall unbundle the subsidy into the Inclining Block Tariff (IBT) and Electrification and Rural components, and users of the network from a load perspective shall pay only the Electrification and Rural component.

14.2 Generators shall be exempted from paying the Electrification and Rural subsidy.

15 Reconciliation of Accounts

15.1 These regulatory rules are applicable to the current Electricity Supply Industry (ESI) structure and will be aligned with the Independent System Market Operator (ISMO) once it is approved as Government policy.

15.2 The total energy supplied to loads, irrespective of whether supplied by Eskom or non-Eskom generators, shall be used to determine energy dependent UOS components.

End.