Methodology to Approve Maximum Prices of Piped-Gas in South Africa

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Glossary of Terms and Acronyms

ALSI	All Share Index (of the Johannesburg Stock Exchange)
Distribution	The distribution of bulk gas supplies and the transportation thereof by pipelines with a general operating pressure of more than 2 bar gauge and less than 15 bar gauge or by pipelines with such other operating pressure as the Gas Operator may permit according to criteria prescribed by regulation to points of ultimate consumption or to reticulation systems, or to both points of ultimate consumption and reticulation systems, and any other activity incidental thereto, and "distribute" and "distributing" have corresponding meanings;
Gas Act	Gas Act, 2001 (Act No. 48 of 2001)
JSE	Johannesburg Stock Exchange
K_d	Cost of Debt
K_e	Cost of Equity or Return on Equity
NERSA Act	National Energy Regulator of South Africa Act, 2004 (Act No. 40 of 2004)
Gas	All hydrocarbon gases transported by pipeline, including natural gas, artificial gas, hydrogen rich gas, methane rich gas, synthetic gas, coal bed methane gas, liquefied natural gas, compressed natural gas, re-gasified liquefied natural gas, liquefied petroleum gas or any combination thereof
Tariff guidelines	Guidelines for Monitoring and Approving Piped-Gas Transmission and Storage Tariffs in South Africa, NERSA, 1 May 2009
Price	The charge for gas to a distributor, reticulator or final customer
Regulations	Piped-Gas Regulations, promulgated in terms of the Gas Act, 2001 (Act No. 48 of 2001), gazette No 29792, 20 April 2007
Reticulation	The division of bulk gas supplies and the transportation of bulk gas by pipelines with a general operating pressure of no more than 2 bar gauge to points of ultimate consumption, and any other activity incidental thereto, and "reticulate" and "reticulating" have corresponding meanings
RRM	Regulatory Reporting Manuals
Service	Any service relating to the transmission, distribution, storage, trading, liquefaction or re-gasification of gas
Tariff	The charge for gas services to any customer

Trading	The purchase and sale of gas as a commodity by any person and any services associated therewith, excluding the construction and operation of transmission, storage and distribution systems, and "trading services" has a corresponding meaning
Transmission	The bulk transportation of gas by pipeline supplied between a source of supply and a distributor, reticulator, storage company or eligible customer, or any other activity incidental thereto, and "transmit" and "transmitting" have corresponding meanings;

1.   Introduction

The National Energy Regulator of South Africa ("NERSA" or 'the Energy Regulator') is mandated in terms of the National Energy Regulator Act, 2004 (Act No. 40 of 2004), ('the NERSA Act') to regulate the electricity, piped-gas and petroleum pipeline industries in terms of the Electricity Regulation Act, 2006 (Act No. 4 of 2006); the Gas Act, 2001 (Act No. 48 of 2001); and the Petroleum Pipelines Act, 2003 (Act No.60 of 2003).

This document prescribes the methodology for regulating by approving the maximum prices of piped-gas in the manner prescribed by the Gas Act, 2001 ("the Gas Act"). It covers the following:

- the legal basis (legislative framework) for regulating by approving appropriate maximum prices of piped gas;
- the role of the Energy Regulator in regulating by approving maximum prices of piped gas in South Africa;
- the methodology for the calculation of the maximum prices of piped-gas;
- the methodology for determining the trading margins.
- prescribed sources of data to be used as inputs in the calculation of the maximum prices of piped-gas;
- the manner and content of maximum price applications by licensees or applicants; and
- assessment of maximum price applications by the Energy Regulator.

This document therefore does not reproduce how some elements of the gas transmission and storage tariffs, which are included and passed-through in the final total price(or charges for gas), are calculated. The methodology for transmission and storage tariff calculation is detailed in the NERSA-approved "Guidelines for Monitoring and Approving Piped-Gas Transmission and Storage Tariffs in South Africa," dated 1 May 2009 ("the Tariff guidelines").

2.   The Legislative framework for regulating maximum prices of piped-gas

2.1.   The Gas Act, 2001

NERSA derives its mandate regarding piped-gas maximum prices and gas transmission and storage tariffs from the Gas Act. According to the Gas Act, the "Energy Regulator must regulate prices in terms of section 21(1)(p), in the prescribed manner."

Section 21(1)(p) prescribes that the Energy Regulator, may impose licence conditions within the following framework of requirements and limitations: "maximum prices for distributors, and all classes of consumers must be approved by the Gas Regulator where there is inadequate competition as contemplated in Chapters 2 and 3 of the Competition Act, 1998 (Act No. 89 of 1998)."

In line with this particular requirement, NERSA has developed this methodology for approving maximum prices for gas in the piped-gas industry. However, the requirement to approve maximum prices and hence to use this methodology is contingent on NERSA determining that "there is inadequate competition as contemplated in Chapters 2 and 3 of the Competition Act, 1998" as stipulated in section 21(1)(p) of the Gas Act. This determination forms part of a separate assessment by NERSA that will be performed on a periodic basis.

2.2. Relationship between the tariff guidelines (2009) and the methodology to approve maximum prices for piped-gas (2011)

According to section 4(h) of the Gas Act, the Energy Regulator has a duty to "monitor and approve, and if necessary regulate, transmission and storage tariffs and take appropriate actions when necessary to ensure that they are applied in a non-discriminatory manner as contemplated in section 22."

In order to implement the above mandate (section 4(h) of the Gas Act), NERSA has developed guidelines for monitoring and approving piped-gas transmission and storage tariffs in South Africa (the Tariff Guidelines). The Tariff Guidelines are specifically used in the regulation of charges related to gas services to any customer (i.e. tariffs).

On the other hand, section 21(1)(p) of the Gas Act, prescribes that the Energy Regulator, may impose licence conditions within the following framework of requirements and limitations: "maximum prices for distributors, and all classes of consumers must be approved by the Gas Regulator where there is inadequate competition as contemplated in Chapters 2 and 3 of the Competition Act, 1998." This section of the Gas Act relates to charges for gas (i.e. prices) to distributors, reticulators and final customers.

Therefore the Gas Act differentiates between the methodology that NERSA can use to monitor and approve, and if necessary regulate, tariffs and to approve maximum piped-gas

prices. The tariff guidelines thus give guidance on all transmission and storage tariff activities which are considered a pass-through in this maximum prices methodology. Hence, the Maximum Pricing Methodology has referenced the determination of the trading margins to the Tariff Guideline to ensure that there is consistency in the decisions taken by the Energy Regulator.

2.3. The Piped-Gas Regulations, April 2007 (GG No 29792 of 20 April 2007)

The maximum price determination principles outlined in this methodology, are further informed by the "Price Regulation Procedures and Principles" prescribed in the Piped-Gas Regulations, promulgated in terms of the Gas Act, 2001, gazette No 29792, 20 April 2007 ('the Regulations"). The following are pertinent to this methodology.

- Sub-regulation 4 (3) prescribes that the Energy Regulator must, when approving the maximum price in accordance with Section 21 (1) (p) of the Act:

  a) be objective, i.e. based on a systematic methodology applicable on a consistent and comparable basis;
  b) be fair;
  c) be non-discriminatory;
  d) be transparent;
  e) be predictable; and
  f) include efficiency incentives.

- Sub-regulation 4 (4) prescribes that the maximum prices referred to in sub-regulation 4 (3) must enable the licensee to:
  a) recover all efficient and prudently incurred investment and operation costs; and
  b) make a profit commensurate with risk.

- Sub-regulation (4) (13), provides that, when ownership of gas changes, the price of gas in the new owner's hands refers to the price of gas from the seller plus any tariffs charged by that seller.

- Sub-regulation 4 (6), then requires that, when gas is sold, the accompanying invoice must itemise the constituent elements of the total price reflected on the invoice, including at least the cost of gas, and transport tariffs and any other charges.

These legislative aspects, as prescribed by the Gas Act and the Regulations, are key to defining the scope and nature of the maximum pricing methodology of piped-gas developed by NERSA.

2.3.1. Approving maximum prices of piped gas

In approving:
- NERSA will not set prices but will review maximum piped-gas prices prepared by licensees or applicants;
- NERSA may request licensees or applicants to amend maximum prices; and
- NERSA may approve or decide not to approve maximum gas prices.

The process for application of piped-gas maximum prices application will be as follows:
- Licensees or applicants must submit their piped-gas prices applications 4 months prior to implementation, whilst the first application must be received within 3 months of the approval date of this methodology.
- To ensure consistency of applications and predictability of analysis of the applications, NERSA also specifies the following:-
  a) prescribed sources of information that must be used as input variables for price calculations;
  b) weights applied to energy price indicators; and
  c) the methodology to determine trading margins.

- All licensees (or applicants as appropriate) will have to submit an application for maximum piped-gas price approval (a price application) to NERSA.
- Applicants must provide information regarding the assumptions made in the price calculation, as well as the detailed calculations.
- This application must:-
  o at least be provided on an annual basis, although applicants are allowed to apply for approval of its piped-gas prices for a longer (multi-year) or shorter (e.g. quarterly) period; and
  o indicate the frequency of the desired price adjustment to be approved by the Energy Regulator.

- Where applicants apply for a longer period (e.g. to accommodate long-term contracts), the initial base price will be determined as prescribed in this methodology and the

applicant will specify the manner and frequency of the price adjustment while the contract is valid, for approval by the Energy Regulator. Such contracts and pricing provisions must be compliant with provisions of the Gas Act and the Regulations at all times.

- NERSA will monitor approved prices to assess the impact and to verify if the prices comply with the requirements of the Act and the Regulations.

2.3.2. Implementation and transitional arrangements

The implementation of this methodology is effective upon approval by the Energy Regulator for all licensees other than Sasol Gas. For Sasol Gas, the implementation is effective from 26 March 2014, which marks the end of the Special Regulator Dispensation Period provided for in Clause 3 of Schedule One to the Agreement concerning the Mozambican Gas Pipeline between the Government of South Africa and Sasol Ltd ("the Agreement").

As the Gas Act does not make allowances for exemptions, the process of transition towards compliance with this methodology by Sasol Gas will have to start prior to and be completed by 26 March 2014.

Gas traders who are purchasing gas from Sasol Gas prior to the end of the validity of the Special Regulatory Dispensation Period will use this methodology to base their gas price approval requests on (referring to prices of gas to their customers), provided that the maximum price of gas as contemplated in clause 9 of Schedule One to the Agreement is below the price calculated as per this methodology. If the price in terms of Schedule One to the Agreement is above the price calculated according to this methodology, the Energy Regulator will allow the use of the "pass-through approach" as per section 3.5 of this methodology.

3. Determining the maximum prices of piped-gas

3.1. Formula for calculation of the maximum price of gas

The maximum price for gas (at the point of its first entry into the transmission/distribution system) is referenced to price indicators of certain relevant energy sources as detailed below.

The maximum prices of piped-gas proposed by an applicant or licensee shall be reviewed for purposes of approval by the Energy Regulator based on the following formula:

$$GE = w_1\,CL + w_2\,DE + w_3\,EL + w_4\,HFO + w_5\,LPG$$

where:

GE = Maximum price for gas energy (ZAR/GJ) at the point of its first entry into the piped-gas transmission/distribution system;

CL = indicator of equivalent price of coal;

DE = indicator of equivalent price of diesel;

EL = indicator of equivalent price of electricity;

HFO = indicator of equivalent price of heavy fuel oil;

LPG = indicator of equivalent price of liquefied petroleum gas;

w_n = weighting of the 'n^{th}' indicator in the basket (where, $w_1+w_2+w_3+w_4+w_5 = 100\%$);

.

The formula above is used exclusively for the maximum price of gas energy and does not include trade margins, distribution tariffs, transmission tariffs, storage tariffs and levies.

Once the maximum price of gas is arrived at, all other charges (tariffs and levies) mentioned above shall be included to arrive at the 'total gas charges' to be invoiced by a licensee.

3.2. Determining the weights (W_n) of the energy indicators in the maximum price formula

The Energy Regulator will approve maximum prices of piped-gas based on the formula in Section 3.1 above with weights for the energy indicators determined as explained in this section.

The Energy Regulator determines these weights by using the total South African secondary energy sources (i.e. excluding the volume of coal used by Eskom for electricity generation). The South African Department of Energy's latest annual publication of 'The Digest of South African Energy Statistics' will be used to determine the relative weights of consumption of these individual energy indicators as a share of the total consumption, as follows:

$$GE = w_1\,CL + w_2\,DE + w_3\,EL + w_4 HFO + w_5\,LPG$$

where:

w_1 =weighting of coal

w_2 =weighting of diesel

w_3 =(weighting of electricity

w_4 =weighting of heavy fuel oil

w_5 =weighting of liquefied petroleum gas

The formula recognises the fact that no single fuel is a perfect substitute for gas. Furthermore, the formula allows maximum prices to be determined at a level that reflects the balance between encouraging new entry and equitable sharing of any economic surplus between consumers and producers. An application of the above formula is used in the calculation in **Appendix 4** "Example**"** of this document as an example.

NERSA will publish a schedule of weights annually to ensure that licensees are informed of the changes in the weights of the various energy indicators. The applicable weights are contained in **Appendix 3 "2011 Maximum price formula."**

3.3.   Prescribed energy indicator prices

The relevant energy indicator prices in the formula in Section 3.1 above for the maximum prices of piped-gas will be as follows :-

Energy Indicator	Price (converted to R/GJ)
a) Coal	'Actual Market Prices for Non-Fuel and Fuel Commodities'

Energy Indicator	Price (converted to R/GJ)
	(Richard's Bay Coal Terminal, Thermal Coal-Free on Board price), per tonne.
b) Diesel	Basic Fuel Price (BFP) for Diesel, per litre.
c) Electricity	Eskom average tariff approved by the Energy Regulator, per kWh.
d) HFO	South African Department of Energy's Energy Balances, HFO price, per litre.
e) LPG	Maximum Refinery Gate Price (Coast) for LPG, per kg.

Should any of the abovementioned price indicators be discontinued or whatever reason no longer be available, NERSA will use a suitable alternative and follow due process to amend this methodology.

3.4. Frequency of price review

The maximum gas prices will be reviewed over a period of 12 months using the 12 month average price of the energy indicators for the preceding period. However, licensees can seek a different review period based on their commercial agreements, in which case the preceding equivalent period average price of energy indicators will be used to review the maximum prices. For example a 6 month gas price review will be done using 6 monthly energy indicator price averages.

For a longer period of price approval (e.g. for long-term contracts), the initial base price will be determined as prescribed in this methodology and the applicant will specify the form and frequency of price adjustments for the duration of the contract for approval by the Energy Regulator.

3.5. Reasonableness of maximum prices, using the 'pass-through of costs' approach

The Energy Regulator recognizes that the methodology for arriving at the maximum price of piped-gas energy as explained in Sections 3.1 to 3.4 will be appropriate under the prevailing

circumstances characterised by the existence of a single gas supplier, with the vast majority of the gas being sourced from a single imported gas supply.

However, where the licensee deems the price determined by this methodology to be materially lower or higher than its preferred and appropriate gas price in that it impacts the ability to compete and/or recover efficiently and prudently incurred costs and make a profit commensurate with risk, then the Energy Regulator will allow such a licensee to opt for the use of the 'pass-through' approach to ensure that the licensee fully recovers all its efficiently and prudently incurred costs and makes a profit commensurate with its risk as provided for in the legislation. This will of course apply to instances when the preferred and appropriate price is either higher or lower, than the one determined by using the approach explained in Sections 3.1 to 3.4. This approach will then become the systematic methodology to be consistently applied throughout the licence period for such a licensee electing to use this 'pass-through' approach.

The pass-through approach requires a cost-based price build-up, including at the least the cost of the procured or produced gas, and any transportation or regasification costs, to justify the price for gas energy applied for. The transmission and distribution tariffs and the trading margin, determined in accordance with this methodology, would be added to the maximum gas energy price.

The onus is upon the licensee to provide the Energy Regulator with the necessary information to substantiate all the elements in the cost-build up required to enable the Energy Regulator to approve the use of 'pass-through' approach and the concomitant maximum gas price.

On conducting this assessment, the Energy Regulator will allow the licensee to recover all prudently and efficiently incurred costs.

The licensee must satisfy the Energy Regulator that:-

- the licensee demonstrates that it procures gas from lower cost gas sources in preference over high cost gas sources for comparable terms of supply (e.g. when the supply concerns imported gas); and/or

- the licensee demonstrates that the costs of indigenous (domestically procured or produced) gas are efficient and prudently incurred (e.g. when the supply concerns domestically produced gas).

3.6. Determining the piped-gas trading margins

It should be noted that all the items covered from section 3.6.1 to 3.7 below relate to trading margins.

In monitoring and approving the piped-gas trading margins, NERSA will be guided by Regulations 4 (3) of the piped-gas regulations, which provides that maximum prices for gas energy and the trading margins must enable the licensee to: recover all efficient and prudently incurred investment and operational costs; and make a profit commensurate with its risks.

3.6.1. Recovery of investment (for fixed assets used in the trading activity)

Ordinarily, *trading* licensees would not have piped-gas network assets, and if they do it would be insignificant [such assets are referred to as the 'Piped-gas trading plant in service' in the Regulatory Reporting Manuals (RMM)]. There may also be limited amounts of non-network assets (referred to as the 'Piped-gas general plant' in the RRM). The sum of the two will form the regulatory asset base (RAB) of a trading licensee.

Investments in such limited and trading-specific piped-gas network assets, which are ordinarily required in the normal course of a piped-gas trading business, plus the general plant used for piped-gas trading, will be recovered through the trading margin.

3.6.2. Recovery of operational costs

All operating costs, including depreciation, that are efficient and prudently incurred by the piped-gas trading licensee shall be allowed as a pass-through in the trading margin. The operating costs to be allowed relate to charges by the trading licensee covering a range of trading services.

These operating costs shall be as grouped and reported to the Energy Regulator in accordance with the RRMs.

3.6.3. Profit commensurate with risk (trading margins) for piped-gas trading

When approving a trading licensee's trading margin, NERSA will assess the price application by conducting its calculations as follows:-

The trader's margin (as a percentage) will be calculated in nominal terms. The nominal Weighted Average Cost of Capital (WACC) of the trader will be the trading margin (%), since all other expenses are allowed to the licensee as a pass-through. In so doing, the Energy Regulator will ensure the return on investment as derived in the cost of capital calculation explained below is achieved.

Gas trading margins will be applied to the sum of 'Cost of Sales' plus 'Trading RAB' of that trader plus 'Working Capital'.

Cost of Sales and operating expenses that are allowable in the piped-gas trading business are those determined in terms of the prescribed Volume 1 and Volume 3 of the Regulatory Reporting Manuals for the piped-gas industry.

The nominal WACC will be calculated as prescribed in **Appendix 1. – Determination of WACC.**

3.7. Determining the trading services margin

a) For trading services provided to transmission customers of a trading licensee:

> **Allowable Revenue (transmission)** **=**
>
> **{Approved Transmission Trader Operating Expenses +**
>
> **((Approved Transmission Trader Costs of Sales + Approved Transmission Trading RAB + Working Capital)* Margin) + T ± C}**

To be billed to customers as a trading margin per GigaJoule as follows: -

TTM in ZAR Gigajoule = Allowable Revenue/VOL

or

TTM =

{Approved Transmission Trader Operating Expense + ((Approved Transmission Trader Cost of Sales + Approved Transmission Trading RAB + Working Capital)* Margin) + T ± C} / VOL

where:

TTM = trading margin in respect of trading services provided to transmission customers in (ZAR/GJ)

VOL = Quantity of gas (e.g. in GJ) traded by the transmission trader for the period
Note: Quantity may be an estimated quantity and may be subject to a clawback/ correction in the next pricing period

Cost of Sales = Opening inventory of gas held for sale + Purchases of gas for sale - Closing inventory of gas held for sale

Margin = Trading margin (%) determined in nominal WACC terms as above

T = Corporate tax expense for the period

C = Clawback (+/-) on volumes

b) For trading services provided to distribution customers of a trading licensee:

Revenue (Distribution) =

{Distribution Trader Operating Expenses +

((Distribution Trader Cost of Sales + Approved Distribution Trading RAB + Working Capital)* Margin) + T ± C}

To be billed to customers as a trading margin per GigaJoule as follows: -

DTM in ZAR/Gigajoule = Revenue/VOL

or

DTM =

{Distribution Trader Operating Expenses +

((Distribution Trader Cost of Sales + Approved Distribution Trading RAB + Working Capital) * Margin) + T ± C} / VOL

where:

DTM = trading margin in respect of trading services provided to distribution customers in (ZAR/GJ)

VOL = Quantity of gas (e.g. in GJ) traded by the distribution trader for the period
Note: Quantity may be an estimated quantity and may be subject to a clawback/ correction in the next pricing period

Cost of Sales = Opening inventory of gas held for sale + Purchases of gas for sale - Closing inventory of gas held for sale

Margin = Trading margin (%) determined in nominal WACC terms as above

T = Corporate tax expense for the period

C = Clawback (+/-) on volumes

c) For trading services provided to trading customers of a trading licensee:

> **Allowable Revenue (trading) =**
>
> **{Approved Trading Operating Expenses + ((Approved Trading Cost of Sales + Approved Trading Services RAB + Working Capital)* Margin + T $\pm$ C}**

To be billed to customers as a trading margin per GigaJoule as follows: -

TSM in ZAR/Gigajoule = Allowable Revenue/VOL

or

> **TSM =**
>
> **{Approved Trading Operating Expenses +**
>
> **((Approved Trading Cost of Sales + Approved Trading Services RAB + Working Capital) * Margin) + T} / VOL**

where:

TSM = trading service margin in respect of trading services provided to trading customers in (ZAR/GJ)

VOL = Quantity of gas (e.g. in GJ) traded by the trading licensee for the period
Note: Quantity may be an estimated quantity and may be subject to a claw-back/ correction in the next pricing period

Cost of Sales = Opening inventory of gas held for sale + Purchases of gas for sale - Closing inventory of gas held for sale

Margin = Trading margin (%) be determined in nominal WACC terms as above

T = Corporate tax expense for the period

C = Clawback (+/-) on VOL

d) For trading services provided to storage customers of a trading licensee:

> **Allowable Revenue (storage) =**
>
> **{Approved Storage Licensee Trading Operating Expenses +**
>
> **((Approved storage licensee Trading Cost of Sales + Approved Storage Trading RAB + Working Capital)* Margin + T }**

To be billed to customers as a trading margin per GigaJoule as follows: -

STM in ZAR/Gigajoule = Allowable Revenue/VOL

or

> **STM =**
>
> **{Approved Storage Licensee Trading Operating Expenses +**
>
> **((Approved Storage Licensee Trading Cost of Sales + Approved Storage Trading RAB + Working Capital) * Margin) + T $\pm$ C} / VOL**

where:

STM = storage licence piped-gas trading service margin in respect of trading services provided to trading customers in (ZAR/GJ)

VOL = Quantity of gas (e.g. in GJ) traded by the storage trading licensee for the period
Note: Quantity may be an estimated quantity and may be subject to a claw-back/ correction in the next pricing period

Cost of Sales = Opening inventory of gas held for sale + Purchases of gas for sale - Closing inventory of gas held for sale

Margin = Trading margin (%) be determined in nominal WACC terms as above

T = Corporate tax expense for the period

C = Clawback (+/-) on VOL

4. Total prices / charges for piped-gas by transmission, distribution, and trading licensees

4.1. Total piped-gas prices by transmission traders inclusive of approved maximum price, margins and applicable tariffs

The total price, or 'charges' for gas, invoiced by a transmission licensee to piped- gas customers includes the approved maximum prices for gas energy and the transmission licensee's tariffs and trading margin. This total price of piped-gas charged by a transmission trading licensee to customers taking gas from a transmission pipeline may be expressed, generically, in the following functional form:-

$$\text{Total Price}_{(Trans)} = GE + TX + TTM + S + LV$$

where:

Trans = For customers of a transmission trader;

GE = Maximum price for gas energy;

TX = Pass-through of monitored and approved or regulated Transmission (network) tariffs;

TTM = Pass-through of approved Transmission trading margin;

S = Pass-through of monitored and approved or regulated Storage tariffs;

LV = NERSA Levy;

In the event of re-gasification or liquefaction of the gas in question, to this formula the following must be added:

RX = pass-through of re-gasification (network) tariffs; or

LX = pass-through of liquefaction (network) tariffs.

As per section 22 of the Gas Act, the 'Licensees may not discriminate between customers or classes of customers regarding access, tariffs, prices, conditions or service except for objectively justifiable and identifiable differences regarding such matters as quantity,

transmission distance, length of contract, load profile, interruptible supply or other distinguishing feature approved by the Energy Regulator.'

Furthermore, as per sub-regulation 4(5), the licensee can propose to the Energy Regulator to approve maximum prices for gas for each distribution area **or group of distribution** areas as indicated in Annexure A of the Regulations, for the following classes of customers:

a) residential; and

b) commercial and industrial.

4.2. Total piped-gas prices by distribution traders inclusive of approved maximum price, margins and applicable tariffs

Where a distribution licensee is buying its piped-gas from the transmission licensee and selling the gas to customers taking the gas from a distribution pipeline, the total price to be invoiced by the distribution licensee may be expression as follows:-

Total Price = Max price for gas energy + transmission and distribution network tariffs + transmission and distribution trading service margin + levy

or

$$\text{Total Price}_{(Dist)} = GE + Tx + Dx + TTM + DTM + LV + S$$

where:

Dist	=	For customers of a distribution trader;
GE	=	Maximum price for gas energy;
TX	=	Pass-through of monitored and approved or regulated Transmission (network) tariffs;
DX	=	Pass through of Distribution (network) tariffs;
TTM	=	Pass-through approved Transmission Trading Margin;
DTM	=	Pass-through of Distribution Trading <argin;
S	=	Pass-through of monitored and approved or regulated Storage tariffs
LV	=	NERSA levy;

In the event of re-gasification or liquefaction of the gas in question, to this formula the following must be added:

RX   =   pass-through of re-gasification (network) tariffs; or

LX   =   pass-through of liquefaction (network) tariffs.

As per section 22 of the Gas Act, the "Licensees may not discriminate between customers or classes of customers regarding access, tariffs, prices, conditions or service except for objectively justifiable and identifiable differences regarding such matters as quantity, transmission distance, length of contract, load profile, interruptible supply or other distinguishing feature approved by the Energy Regulator".

Furthermore, as per sub-regulation 4(5), the licensee can propose to the Energy Regulator to approve maximum prices for gas for each distribution area **or group of distribution** areas as indicated in Annexure A of the Regulations, for the following classes of customers:

   a) residential; and
   b) commercial and industrial.

4.3. Total piped-gas prices by a trading licensee inclusive of approved maximum price and applicable tariffs

Where a trading licensee (trader) buys its gas from the distribution licensee (who bought its gas from a transmission licensee), the maximum price of the trader shall include the transmission licensee's tariffs, the distribution licensee's tariff on to which the trader's own tariffs/margin will then be added to obtain the total price charged by the trader to its piped-gas customers. The price of piped-gas charged by a trading licensee to customers is the maximum price for gas energy plus tariffs plus levies and may be expressed, generically, as follows:-

Total Price = Max price for Gas Energy + transmission and distribution network tariffs + transmission and distribution trading service tariffs + storage tariffs + trading margin + levy.
Or

$$\text{Total Price }_{(trader)} = GE + TX + DX + TT + DT + TSM + S + LV$$

where

Trader = For customers of a trader;

GE = Maximum price for gas energy;

TX = Pass-through of monitored and approved or regulated Transmission (network) tariffs;

DX = Pass-through of Distribution (network) tariffs;

TTM = Pass-through of approved Transmission Trading) Margin;

DTM = Pass-through of Distribution Trading Margin;

TSM **=** Approved trading service margin

S = Pass-through of monitored and approved or regulated Storage tariffs;

LV = NERSA Levy;

In the event of re-gasification or liquefaction of the gas in question, to this formula the following must be added:

RX = pass-through of re-gasification (network) tariffs; or

LX = pass-through of liquefaction (network) tariffs.

As per section 22 of the Gas Act, the 'Licensees may not discriminate between customers or classes of customers regarding access, tariffs, prices, conditions or service except for objectively justifiable and identifiable differences regarding such matters as quantity, transmission distance, length of contract, load profile, interruptible supply or other distinguishing feature approved by the Energy Regulator'.

Furthermore, as per sub-regulation 4(5), the licensee can propose to the Energy Regulator to approve maximum prices for gas for each distribution area **or group of distribution** areas as indicated in Annexure A of the Regulations, for the following classes of customers:

a) residential; and

b) commercial and industrial.

4.4. Total prices by a trading storage licensee inclusive of approved maximum price and tariffs

Where a trading licensee (trader) buys its gas from the distribution licensee (who bought its gas for a transmission licensee), the maximum price of the trader shall include the transmission licensee's tariffs, the distribution licensee's tariff on to which the trader's own tariffs/margin will then be added to obtain the total price charged by the trader to its piped-gas customers. The price of piped-gas charged by a trading licensee to customers is the maximum price for gas energy plus tariffs plus levies and may be expressed, generically, as follows:-

Total Price = Max price for Gas Energy + transmission and distribution network tariffs + transmission and distribution trading service margins + storage tariffs + trading margin + levy.

or

$$\text{Total Price}_{\text{(storage trading license)}} = GE + TX + DX + TTM + DTM + STM + S + LV$$

where

Storage trading licensee = For customers of a storage trading licensee;

GE = Maximum price for gas energy

TX = Pass-through of monitored and approved or regulated Transmission (network) tariffs

DX = Pass-through of Distribution (network) tariffs

TTM = Pass-through approved Transmission Trading Margin

DTM = Pass-through of Distribution Trading Margin

STM = Approved storage licensee's trading service margin

S = Pass-through of monitored and approved or regulated Storage tariffs

LV = NERSA Levy

In the event of re-gasification or liquefaction of the gas in question, to this formula the following must be added:

RX = pass-through of re-gasification (network) tariffs; or

LX = pass-through of liquefaction (network) tariffs.

As per Section 22 of the Gas Act, the "Licensees may not discriminate between customers or classes of customers regarding access, tariffs, prices, conditions or service except for objectively justifiable and identifiable differences regarding such matters as quantity,

transmission distance, length of contract, load profile, interruptible supply or other distinguishing feature approved by the Energy Regulator"

Furthermore, as per sub-regulation 4(5), the licensee can propose to the Energy Regulator to approve maximum prices for gas for each distribution area **or group of distribution** areas as indicated in Annexure A of the Regulations, for the following classes of customers:

a) Residential; and

b) Commercial and industrial.

5.   Utilisation of maximum gas prices in defining prices per customer class

NERSA will in terms of this methodology approve a single maximum price per licensee, based on which customer category maximum prices will be approved. Annexure A of the Piped-gas Regulations prescribes the different classes of customers for which maximum prices must be approved. A licensee must apply for maximum prices for each customer class and each customer category's price must be below the maximum price as approved by the Energy Regulator for that licensee. The table of customers as per Annexure A of the Piped-gas Regulations is provided below:

Annual consumption	
Class 1	< 400 GJ
Class 2	401 to 4 000 GJ p.a
Class 3	4001 to 40 000 GJ pa
Class 4	40 001 to 400 000 GJ pa
Class 5	400 001 to 4 000 000 GJ pa
Class 6	>4 000 000 GJ pa

6.   Review and modification of the Methodology

The Energy Regulator will consult with regulated entities on an ongoing basis to ensure the objectives and requirements of the methodology are being met. The Energy Regulator will

advise licensees on the interpretation and application of the methodology. The Energy Regulator will also invite detailed feedback from the regulated entities on aspects of the methodology that are either working well or that need amendment.

The Energy Regulator will conduct review of the content of this methodology within 5 years after implementation. Subsequent reviews will be done every 5 years to ensure that the methodology reflects the changing regulatory circumstances. The Energy Regulator also recognizes that special circumstances may arise that could necessitate ongoing changes, perhaps more frequently than the envisaged 5 year review cycle. This provision would therefore not preclude on-going incorporation by the Energy Regulator of justifiable changes that are considered necessary to provide clarity, transparency and regulatory efficiency benefits.

7. Appendices

7.1. Appendix 1 – Determination of WACC

The weighted average cost of capital is the average of the cost of equity and debt, weighted by the proportions of equity and debt which an efficiently financed company can be expected to use to fund its activities. Hence, to determine the WACC, it is necessary to determine the cost of debt and equity and the proportions of debt and equity that would be employed in an efficiently financed company.

When determining the revenues and trading margins, the regulator will allow not only for the post-tax WACC return but must also allow for tax shield relating to debt finance. Since the tax treatment of debt (deductible as a cost) is different from the tax treatment of equity (not deductible as a cost), the allowed revenues to fund taxation will be a function of the proportions of debt and equity that would be employed by an efficiently financed business.

Trading licensees will be expected to submit their WACC calculations based on evidence regarding the cost of debt and the cost of equity. Internationally recognised approaches to the calculation of cost of debt and the return on equity should be used (for example with the Capital Asset Pricing Model (CAPM) for the cost of equity).

The following formula is used to determine the WACC using CAPM –

$$WACC = \left[\left(\frac{E}{Dt + E} \right) * Ke \right] + \left[\left(\frac{Dt}{Dt + E} \right) * Kd \right]$$

Where:

E= equity

Dt= debt

Ke= the cost of equity in terms of the Capital Asset pricing Model (CAPM)

Kd= the cost of debt

CAPM is the preferred approach as it is the most common methodology in the determination of cost of capital. However, if CAPM is considered to be inappropriate, companies have the opportunity to submit based on any other internationally recognized and used cost of capital approaches.

Applicants are expected to provide a rationale for the approach used, and this will be assessed by the Energy Regulator on a case-by-case basis.

When prices and trading margins are considered by NERSA, the trading margin will be approved at a level to ensure that appropriate levels of financial ratios will be met, based on prevailing financial market conditions and best practices in South Africa.

If the Capital Asset Pricing Model is adopted for the calculation of WACC, one of the key components that will need to be estimated is Beta.

Cost of equity

The cost of equity is the rate of return available on alternative equity investments of comparable risk. In the WACC formula, it is calculated as:

$$Ke = r(f) + \beta(e)*MRP$$

where:

> **r(f)** is the risk-free rate. It represents the return an investor can achieve on the least risky asset in the market. Generally government bonds are used when estimating the cost of capital.
>
> β **(e)** is the equity beta, which measures the covariance between the return on the firm's equity and the returns from the stock market as a whole. Beta is an important parameter calculated by the regulator, and more details on its calculation is provided below.
>
> **MRP** is the market risk premium, which represents the additional expected return investors require to invest funds into equities rather than risk-free instruments. It can be calculated using historical averages and/or market based forward looking approaches. At present historical averages is the preferred method.

Beta

β = 'beta', is the measure systematic risk parameter for regulated entities providing gas trading services and facilities. The methodology to be used to determine the beta is set out below:

For licensees that are not publicly listed and where there are insufficient publicly listed competitors the equity beta must be determined by proxy. As a proxy the average of six (6) pipeline (international) companies listed on stock exchanges must be used (approved by the Energy Regulator). To make adjustments for differences in gearing between the proxy and the licensee the process involves and 'unlevering' and 'relevering' as follows:

- Obtaining the equity beta for the proxy company
- Unlevering the beta of the proxy company by the gearing level of the proxy company. This unlevered beta is known as the asset beta.
- Calculating the weighted average of the asset betas for the chosen proxy companies
- Relevering the average asset beta by the (optimal) gearing expected of an efficiently financed licensee to fund its licensed activities

The following steps and formulae must be used:

Step 1 – Calculate asset beta (or unlevered beta) for proxy firm

The following formula must be used to determine the asset beta –

$$\beta_{a1} = \frac{\beta 1}{1 + [1 - Tr] * \left[\dfrac{D}{E}\right]}$$

Where:

β_{a1} = asset beta for proxy company 1

$\beta 1$ = beta of proxy company 1 (will be given)

Tr = tax rate of relevant country

D = debt

E = equity

Repeat step 1 for each of the 6 chosen proxy companies.

Step 2 – Calculate weighted average asset beta of proxy companies

Weight each of the 6 proxy firm asset betas by their proportion of the total debt plus equity of the 6 proxy firms and sum the 6 results using the following formula –

$$\beta_a E = \sum_{n=1}^{6}\left[\left(\frac{(D+E)n}{\sum_{n=1}^{6}(D+E)n}\right) * (\beta a)_n\right]_n$$

Where:

$\beta_a E$ = weighted average asset beta of the regulated entity

$(D+E)n$ = sum of the debt and equity for a specific proxy company

$(\beta a)_n$ = asset beta of the corresponding specific proxy company

$\sum_{n=1}^{6}(D+E)n$ = sum of debt and equity for all proxy companies

Step 3 – Calculation of beta (β) for licensee

The following formula must be used to determine the beta for the licensee –

$$\beta_L = [WA\ \beta][1+(1-t)(D/E)]$$

Where:

B_L = beta for the licensee

WA β = the weighted average β of the proxy firms asset betas from Step 2.

t = tax rate of the licensee

D = the debt of the licensee subject to a minimum gearing level of 30%

E = the equity of the licensee

Cost of debt

The actual cost of debt incurred by the licensee must be allowed subject to the Energy Regulator finding it reasonable through the application of reasonableness tests.

The actual cost of debt must be determined by estimating the actual weighted average interest charged on debt achieved by the licensee for the tariff period under review.

Where the cost of Debt is not known (yet) the lenders' estimate of interest rates for the forthcoming pricing period must be used. Where the licensee has business activities that are not regulated by the Energy Regulator and the licensee raises corporate debt then the actual cost of debt charged to the regulated activities must fairly reflect the risks of those regulated activities as prescribed in the RRM and approved by the Energy Regulator in a Cost Allocation Manual;

The cost of debt is calculated as:

$$Kd = r(f) + Dp$$

where:

  r(f)   is the risk free rate

  Dp   is the borrowing / debt margin or yield.

  The debt margin represents the difference in the redemption yield on a corporate bond and the yield on a government bond (the risk-free rate). Lenders require a higher return for lending to a company rather than a government due to higher default risk.

7.2. Appendix 2 – Data Sources

In order to provide certainty and predictability the following data sources will be used for the various elements in the formula for the approval of maximum price of piped-gas energy. Licensees are allowed to propose other sources not listed below, subject to approval by the Energy Regulator.

Variable Element	Source of data
a) Weighting for the energy indicator (w_n)	South African Department of Energy: - 'Digest of South African Energy Statistics' - 'Energy Balances'

Variable Element	Source of data
b) Price of coal	International Monetary Fund (IMF): -'Actual Market Prices for Non-Fuel and Fuel Commodities' (Richard's Bay Terminal, Thermal Coal-Free on Board price) [1] Converted to R/GJ
c) Price of diesel	South African Department of Energy: -'Basic Fuel Price (BFP) for Diesel', Quoted in SA cents/litre converted to R/GJ
d) Price of electricity	Eskom average tariff approved by the Energy Regulator, cents per KWh, converted to R/GJ. www.nersa.org.za
e) Price of HFO	United Kingdom Department of Energy and Climate Change. www.decc.gov.uk converted to R/GJ
f) LPG	South African Department of Energy: -'Maximum Refinery Gate Price (Coast)' for LPG, www.energy.gov.za converted to R/GJ
g) Inputs for Weighted Average Cost of Capital (WACC) for Trading Margin	Approved data sources for Tariff Guidelines published on NERSA website
h) Financial information to determine piped-gas trading service margin of a licensee	As prescribed by the Regulatory Reporting Manuals Volume 3
i) Exchange rates	South African Reserve Bank - Historical exchange rates, 'monthly mean' - www.resbank.co.za

Adjustments to the indicators will be made by NERSA from period to period in the frequency applied for by the Licensee and as approved by the Energy Regulator.

7.3.   Appendix 3 - 2011 maximum price formula

Determining weights based on Department of Energy published data of national energy consumption mix by the various energy carriers

In terms of the maximum pricing methodology, the maximum price for gas energy must be determined by reference to energy price indicators relevant to South Africa.

The energy mix of the country can be used to arrive at the weights for different energy sources.

The information on Table I below is based on Energy Balances as compiled by the Department of Energy (DoE). The DoE follows the International Energy Agency framework when compiling the Energy Balances. According to the Statistics Manual, the main aim of the Energy Balances (measured in physical units) is to serve as indicators of energy consumption and energy efficiency. This is done at national level for every energy commodity in use, with the aim to make comparisons with the outside world. The energy use of products refers to the consumption of the product by various industries and households. Furthermore, the energy use table as published by DoE includes both primary and secondary energy sources. For the purposes of this methodology, the indicators from the secondary energy sources are used.

Table 1 Energy Use for South Africa from 2005 to 2008

Total Final Consumption in Terajoules (TJ)								
	2005		**2006**		**2007**		**2008**	
	TJ	%	TJ	%	TJ	%	TJ	**%**
Coal	770 997	40.86	729 730	39.41	743 262	38.36	795 858	**37.00**
Diesel	308 805	16.37	320 333	17.30	371 654	19.18	520 952	**24.00**
HFO	20 334	1.08	19 801	1.07	19 509	1.01	23 648	**1.00**
LPG	14 685	0.78	13 378	0.72	16 991	0.88	17 323	**1.00**
Electricity	772 072	40.92	768 628	41.51	786 153	40.57	779 140	**37.00**
Total	**1 886 893**	**100**	**1 851 870**	**100**	**1 937 569**	**100**	**2 136 921**	**100**

Source: Data from DoE Energy Balances Report, and NERSA calculations of percentages adjusted for gas consumption and other energy sources that are not included as alternatives for gas. The coal weight has been reduced to adjust for the primary use of coal in electricity generation.

Using the percentages for 2008 shown in the above table the following weights are assigned to the various energy price indicators proposed for use in the Methodology for approving maximum prices for piped gas.

The **2011** maximum value price formula when substituted with the 2008 weights is expressed as follows:

$$GE = 0.37\,CL + 0.24\,DE + 0.37\,EL + 0.01\,HFO + 0.01\,LPG$$

7.4. Appendix 4 – Example

Determining the maximum Gas Energy Price using the Energy Indicators (i.e. not the pass-through approach) entails the following 7 steps:

Step 1: Obtain the energy price indicators (as provided by NERSA in this methodology)

Step2: Determine the weights (using the sources provided by NERSA in this methodology)

Step 3: Determine conversions of the energy indicators (the calorific energy value equivalents) to gas (guidance as provided in this example)

Step 4: Determine the average price for the preceding 12 months for each of the energy indicators and foreign exchange rates for the same period (using sources as provided by NERSA in this methodology)

Step 5: Substitute all the above values into the formula in this methodology to calculate in the value of gas energy. (This becomes the gas molecule price excluding the transmission tariff, distribution tariff, storage tariff, trading margin, other services charges and before discounts)

Step 6: Apply discounts for the different customer categories to the Gas Energy Value, or alternatively perform step 7 before this step.

Step 7: Add the efficient and prudently incurred expenses, other services charges (including, pass through of Transmission and/or Distribution tariffs), as well as the trading margin to arrive at the Total Price for piped-gas.

Example 1:

The following is a numeric illustration of the above 7 steps by way of an _example_. Please note that the discounts provided below the maximum as well as the period of price review are licensee specific:-

Step 1: Energy Indicators in the methodology are as follows:

1	Thermal Coal
2	HFO
3	Electricity
4	Diesel
5	LPG

Step 2: The Weights of the selected energy carriers in the formula are calculated based on latest available (Energy Digest 2008) consumption Energy Carriers in the formula as follows:

2008 National Energy Consumption (Source: DoE Energy Statistics)		
Total Final Consumption		
In terajoujes (TJ)		
	2008	
	TJ	%
Coal	795 858	37.00%
Diesel	520 952	24.00%
HFO	23 648	1.00%
LPG	17 323	1.00%
Electricity	779 140	37.00%
Total	**2 734 916**	**100.00%**

Source: Extracts of data from the DoE Energy Balances Report for the five selected Energy Carriers; and NERSA calculation of the percentages

Step 3: Energy value equivalent of the indicators are as follows:

Conversions		
Coal	27	GJ per tonne
HFO	43	GJ per tonne
Electricity	0.0036	GJ per kWh
Diesel	0.0381	GJ per litre
LPG	0.0267	GJ per litre

Step 4: Determine the average price for the preceding 12 months for each of energy indicators. The values used in this example are as follows:

Energy Indicator	**Average Price**	**units**
Thermal Coal	113.11	USD/Tonne
HFO	423.11	USD/Tonne
Electricity	45.92	c/kWh
Diesel	523.38	c/litre
LPG	356.02	c/litre

Step 5: Obtain (from South Africa Reserve Bank) the average exchange rate for the period that corresponds to the period for which the average price is determined (e.g. 12 months):

Exchange Rate-SA rand per US dollar & GBP (£)	$ rate	£ rate
Aug, 2011		11.5535
Jul, 2011	6.7931	10.9534
Jun, 2011	6.7875	11.0071
May, 2011	6.861	11.2073
Apr, 2011	6.7324	11.0085
Mar, 2011	6.9086	11.1658
Feb, 2011	7.1911	11.6034
Jan, 2011	6.9021	10.8764
Dec, 2010	6.8294	10.6621
Nov, 2010	6.972	11.1365
Oct, 2010	6.9177	10.9651
Sep, 2010	7.1389	11.107
Aug, 2010	7.2973	
Average	**6.944258**	**11.10384**

Source: www.resbank.co.za/Research/Statistics/Pages/MonthlyReleaseOfSelectedData.aspx

Step 5: Substitute all the above variables into the Maximum Price formula in the methodology and calculate the value of gas before discounts as follows:

Indicator	Energy Form	Market Price US$ or GBP/tonne a	Energy Value GJ/tonne b	Energy Price US$/GJ c=a x b	Average Exchange rate Rands/US$ & GBP d	Energy price Rands/GJ e = c x d	Weights % f	Gas Energy Price R/GJ g = e*f
1	Thermal Coal	113.11	27	4.19	6.94	29.09	37%	10.76
2	HFO	423.11	43	9.84	11.10	109.26	1%	1.09
3	Electricity				6.94	127.56	37%	47.20
4	Diesel				6.94	137.37	24%	32.97
5	LPG				6.94	133.34	1%	1.33
Maximum Price							100%	93.35

Note: R93.35 per GJ is the value of Gas Energy before discount

Step 6 & 7: Add efficiently incurred costs to the above gas energy prices and apply discounts for the various customer categories

A: For the Transmission Trader the outcome will be as follows:

Transmission Trader	Annual Sales Volumes (GJ)	Annualised costs	Class 1 < 400 GJ p.a. R/GJ	Class 2 401 - 4 000 GJ p.a. R/GJ	Class 3 4 001 - 40 000 GJ p.a. R/GJ	Class 4 40 001 - 400 000 GJ p.a. R/GJ	Class 5 400 0001 - 4 000 000 GJ p.a. R/GJ	Class 6 > 4 000 000 GJ p.a. R/GJ
Transmission Trader Sales	100 000 000	**9 335 399 612**	**93.35**	**93.35**	**93.35**	**93.35**	**93.35**	**93.35**
Operating expenses (3% of sales)	3%	**280 061 988**	**2.80**	**2.80**	**2.80**	**2.80**	**2.80**	**2.80**
Margin =		**1 213 601 949**	**12.14**	**12.14**	**12.14**	**12.14**	**12.14**	**12.14**
Working capital (1 months's sales, at average)		777 949 968						
Cost of Sales		9 335 399 612						
RAB		-						
WACC		12.0%						
Gas Price before discount and pass-through of Tx and Dx tariffs			**108.29**	**108.29**	**108.29**	**108.29**	**108.29**	**108.29**
Transmission Tariff		**1 803 000 000**	**18.03**	**18.03**	**18.03**	**18.03**	**18.03**	**18.03**
CPF to Secunda		1 013 000 000	10.13	10.13	10.13	10.13	10.13	10.13
Secunda to Durban (TPL line)		790 000 000	7.90	7.90	7.90	7.90	7.90	7.90
Gas Price before discount			**126.32**	**126.32**	**126.32**	**126.32**	**126.32**	**126.32**
Discount%			15.0%	20.0%	22.5%	25.0%	27.5%	30.0%
Discount (Rands/GJ)			-16.24	-21.66	-24.37	-27.07	-29.78	-32.49
Discounted gas price (R/GJ)			92.05	86.63	83.93	81.22	78.51	75.80
Total Price charged by Tx Trader (Rands/GJ)		**12 632 063 549**	**110.08**	**104.66**	**101.96**	**99.25**	**96.54**	**93.83**

Notes:

1. The above example is only for illustrative purposes. Typically in competitive markets, the customer's bills from the trader will indicate a distribution tariff and a transportation tariff.

2. This table contains hypothetical values for sales volumes, operating expenses, working capital, RAB, WACC and the distribution tariff and example values for the discounts per customer category.

3. Discount is applied on elements of price excluding the pass-through costs of Transmission and Distribution tariffs.

Assumptions for the example calculations above:

1. The Transmission trader sales 100million gigajoules of gas per annum

2. The Transmission trader's operating expenses are 3% of his cost of sales

3. The transmission trader's margin is 12%

4. The pass-through transmission tariff is a total of R18.03 R/GJ

5. The transmission trader offers various levels of discounts ranging from 15% for class 1 customers to 30% for class 6 customers

B: For the Distribution Trader the outcome will be as follows:

Distribution Trader (Assumes buys from Transmission Trader at Class 6 Rate)							
Annual Sales Volumes (GJ)		**Annualised costs**	**Class 1**	**Class 2**	**Class 3**	**Class 4**	**Class 5** 400 0001 - 4 000 000 GJ p.a.	**Class 6** > 4 000 000 GJ p.a.
			< 400 GJ p.a.	401 - 4 000 GJ p.a.	4 001 - 40 000 GJ p.a.	40 001 - 400 000 GJ p.a.		
			R/GJ	R/GJ	R/GJ	R/GJ	R/GJ	R/GJ
Distribution Trader Sales	10 000 000	758 034 448	75.80	75.80	75.80	75.80	75.80	75.80
Operating expenses (5% of sales)	5%	37 901 722	3.79	3.79	3.79	3.79	3.79	3.79
Margin =		164 240 797	16.42	16.42	16.42	16.42	16.42	16.42
Working capital (1 months's sales, at average)		63 169 537						
Cost of Sales		758 034 448						
RAB		-						
WACC		20%						
Gas Price before discount and pass-through of Tx and Dx tariffs			**96.02**	**96.02**	**96.02**	**96.02**	**96.02**	**96.02**
Transmision Tarif		180 300 000	18.03	18.03	18.03	18.03	18.03	18.03
CPF to Secunda		101 300 000	10.13	10.13	10.13	10.13	10.13	10.13
Secunda to Durban (TPL line)		79 000 000	7.90	7.90	7.90	7.90	7.90	7.90
Distribution tariff-Durban to Prospecting		3 046 945	0.30	0.30	0.30	0.30	0.30	0.30
Gas Price before discount			114.35	114.35	114.35	114.35	114.35	114.35
Discount%			0.0%	2.5%	5.0%	7.5%	10.0%	15.0%
Discount (Rands/GJ)			0.00	-2.40	-4.80	-7.20	-9.60	-14.40
Discounted gas price (R/GJ)			96.02	93.62	91.22	88.82	86.42	81.62
Total Price charged by Distribution Trader (Rands/GJ)		**1 143 523 913**	**114.35**	**111.95**	**109.55**	**107.15**	**104.75**	**99.95**

Notes:

1. The above example is only for illustrative purposes. Typically in competitive markets, the customer's bills from the trader will indicate a distribution tariff and a transportation tariff.
2. This table contains hypothetical values for sales volumes, operating expenses, working capital, RAB, WACC and the distribution tariff and example values for the discounts per customer category.
3. Discount is applied on elements of price excluding the pass-through costs of Transmission and Distribution tariffs.

Assumptions for the example calculations above:

1. The Distribution trader buys 10 million gigajoules of gas per annum from the Transmission trader at the class 6 price of R75.80 per gigajoule

2. The R75.80 excludes the pass-through transmission tariff which is a total of R18.03 per GJ

3. The Distribution trader sells the 10 million gigajoules of gas per annum

4. The Distribution trader's operating expenses are 5% of his cost of sales

5. The distribution trader's margin is 20%

6. The pass-through of distribution tariff is a total of R0.30 per GJ

7. The distribution trader offers various levels of discounts ranging from 0% for class 1 customers to 15% for class 6 customers