



# **Guidelines for Monitoring and Approving Piped-Gas Transmission and Storage Tariffs in South Africa**

***Final***

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These Tariff Guidelines replace the 2009 version

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## Glossary

**Clawback** Factor to correct for differences between actual values and assumptions used in the calculation of the tariff

**Giveback** Factor to correct for differences between actual values and assumptions used in the calculation of the tariff (a negative clawback)

## Abbreviations

**CAPM** Capital Asset Pricing Model

**CPI** Consumer Price Index

**AR** Allowable Revenue

**DSCR** Debt Service Cover Ratio

**EBIT** Earnings Before Interest and Tax

**FERC** Federal Energy Regulatory Commission

**IRR** Internal Rate of Return

**MRP** Market Risk Premium

**O&M** Operating and Maintenance

**Opex** Operational expenditure

**PPI** Producer Price Index

**RAB** Regulatory Asset Base

**SRAB** Starting Regulatory Asset Base

**TOC** Trended Original Cost

**WACC** Weighted Average Cost of Capital

## **1 Introduction**

The National Energy Regulator (NERSA) derives its mandate regarding piped-gas tariffs and maximum prices from the Gas Act, 2001 (Act No. 48 of 2001) ('the Gas Act'). According to the Gas Act, the Energy Regulator is required to 'monitor and approve, and if necessary regulate' transmission and storage tariffs for piped-gas and 'take appropriate action when necessary to ensure that tariffs are applied in a non-discriminatory manner'. In line with these requirements, NERSA has developed guidelines for monitoring and approving piped-gas transmission and storage tariffs.

In 2009, NERSA developed these Guidelines for Monitoring and Approving Transmission and Storage Tariffs in South Africa ('the Guidelines'). NERSA has updated these guidelines in order to reflect developments in the industry since 2009, as well as possible future developments, as well as to clarify issues that have arisen and gaps that have been identified through the implementation and practical application of the guidelines, and align the guidelines to published government policy and legislation.

## 2 The Policy and Legislative Framework

### 2.1 Introduction

After an overview of the general objectives for the economic regulation of gas tariffs, this section provides a review of the legal aspects of gas sector regulation, including:

- the mandate of the Energy Regulator with regard to the regulation of the gas industry;
- the role of the Energy Regulator in monitoring, approving and regulating gas transmission and storage tariffs;
- the obligations of participants in the piped-gas sector.

These aspects are key to defining the scope and nature of the gas transmission and storage tariff guidelines developed by NERSA.

### 2.2 Objectives for tariff regulation

The following objectives generally apply to the monitoring and approving of tariffs for the transmission and storage of piped-gas:

- *Cost reflectiveness.* The tariffs for services provided by a transmission or storage facility should reflect the direct and assignable costs associated with providing those services to a particular customer. To be fully cost reflective, fixed capacity related costs should be recovered via a capacity charge and volume related costs should be recovered by a demand charge. It is an established economic principle that cost-reflective tariffs provide appropriate incentives in a network industry.
- *Economically appropriate pricing signals.* It is important that the tariffs provide users and potential users of gas transmission or storage services with the correct economic signals regarding the economic cost of the service.
- *Incentives for efficient operation of a system.* The tariffs should reflect the costs required by an efficient operator to run the system.
- *Allow for full cost recovery and ensure a reasonable return.* The selected methodology should enable the transmission and storage companies to

recover the costs of delivering those services,<sup>1</sup> plus a reasonable return to ensure the long-term provision of transmission and storage services.

- *Non-discrimination.* The tariff structure should not discriminate between customers, unless such discrimination is based on the objectively justifiable and identifiable differences as set out in section 22 of the Gas Act.
- *Transparency.* Transparency is required to ensure a balance between buyer and seller power in the market and to facilitate regulation. If tariffs are not transparent, it is difficult for pipeline or storage users to respond to incentives or disincentives contained in these tariffs or for competition between facilities to occur.
- *Predictability.* In addition to transparency, consumers will value the ability to forecast their gas transportation and storage costs and to be able to make informed business decisions.
- *Practicality.* In addition to the above, the selected method must be suitable for efficient implementation and administration.
- *Public interest and social objectives.* Consistent with Government policy, tariffs may be designed to take account of social objectives. For instance, certain surcharges or cross-subsidies may be introduced with the aim of funding the provision of affordable services to low income sectors of the population.

## 2.3 Legislative framework and requirements of the Energy Regulator

### 2.3.1 *The National Energy Regulator Act, 2004*

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; and the Petroleum Pipelines Act, 2003 (Act No. 60 of 2003).

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<sup>1</sup> Typically, regulators allow recovery of efficiently incurred costs rather than the actual costs incurred by the company as part of incentive regulation.

The Energy Regulator embarked on an extensive consultation process regarding its proposed guidelines for monitoring and approving tariffs for gas transmission and storage tariffs, in compliance with the requirements of the NERSA Act.

### **2.3.2 Gas Act, 2001**

The Gas Act aims to *inter alia* promote the orderly development of the piped-gas industry and to establish a national regulatory framework with the National Gas Regulator (now NERSA) as the custodian and enforcer of this national regulatory framework.

The Gas Act further contains a list of objectives for the development of the piped-gas industry in South Africa, ranging from investment and competitive markets to skills and employment equity promotion. Notably the Gas Act aims to promote ‘the efficient, effective, sustainable and orderly development and operation of gas transmission, storage, distribution, liquefaction and re-gasification facilities’ and ‘the provision of efficient, effective and sustainable gas transmission, storage, liquefaction, re-gasification and trading services’.

The functions of the Energy Regulator are *inter alia* to:

- issue licences for construction, conversion and operation of gas facilities and trading in gas;
- undertake investigations and inquiries into the activities of licensees; and
- regulate prices in terms of section 21(1)(p) in the prescribed manner.

Furthermore, the Energy Regulator has a duty as laid out in section 4(h) of the Gas Act 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.’

The above objectives and the functions of the Energy Regulator were taken into consideration in the development of these guidelines.

## 2.4 The role of the Energy Regulator in piped-gas tariffs

In terms of section 2 of the Gas Act, the Energy Regulator is required to 'promote the efficient, effective, sustainable and orderly development and operation of gas transmission, storage, distribution' and related activities in South Africa.

In order to enable the Energy Regulator to achieve the objectives of the Gas Act as listed in section 2 of the Act, the Energy Regulator is, *inter alia*, required to issue licences for the construction, conversion and operating of gas transmission, storage, and distribution facilities and for trading of gas. In addition, the Energy Regulator is required to ensure compliance with licence conditions and is also given the authority to undertake investigations and enquiries into the activities of licensees.

Section 4(h) of the Gas Act further provides that the Energy Regulator must 'monitor and approve and, if necessary, regulate' transmission and storage tariffs. This is operationalised as follows:

- the monitoring process requires the Energy Regulator to ensure that the tariff is being applied and adhered to;
- in giving effect to its duties to monitor and approve the tariff, the Energy Regulator may direct enquiries to the licensees to establish that the tariff is appropriate before approval;
- the Energy Regulator is required to determine, at regular intervals, whether the tariff requires any adjustment; and
- the Energy Regulator is required to regulate the tariffs, if necessary, to ensure that NERSA is fulfilling its regulatory duties, *inter alia* by ensuring tariffs are cost reflective and applied in a non-discriminatory manner.

## 2.5 The legal status of the Guidelines

These Guidelines have been developed pursuant to the provisions of section 4(n) of the Gas Act in an effort to simplify and systematize the processes associated with the performance of the express statutory function and duty of NERSA, which is laid down in section 4(h), and thereby promote the achievement of reasonable and consistent decision-making as well as provide a measure of useful predictability and certainty for piped-gas tariff regulation.

For this reason, which makes these Guidelines compatible with the enabling legislation, they are considered lawful and legally binding as per what was noted in *Mazibuko NO v Sisulu and Others 2013 (6) SA 249 (CC)* in *paragraph 70* on what constitutes a legal and valid instrument.

NERSA will use these Guidelines in evaluating every relevant tariff application it receives; and it will be competent to decide on such application using these Guidelines, provided it is independently satisfied that they are well suited to the tariff application concerned; and it will only depart from them, to the extent necessary, if it finds something exceptional in the tariff application that cannot be adequately dealt with in terms of the guidance already contained in these Guidelines.<sup>2</sup>

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<sup>2</sup> This is in line with the well-established principles of South African Law that discourages the rigid and inflexible application of the guidelines - see. *MEC for Agriculture, Conservation, Environment & Land Affairs v Sasol Oil (Pty) Ltd 2005 (6) SA 483 (SCA)*; *Kemp and Others v Van Wyk and Others [2005] ZASCA 77*; *National Lotteries Board v SA Education and Environment Project 2012 (4) SA 504 (SCA)*; and *Arun Property Development (Pty) Ltd v City of Cape Town [2014] ZACC 37*

## 3 Tariff Application

### 3.1 Introduction

As indicated above, NERSA has a duty as laid out in section 4(h) of the Gas Act to ‘monitor and approve and, if necessary, regulate’ transmission and storage tariffs. In practice, this is interpreted as follows:

In monitoring and approving:

- NERSA will not set tariffs, but will review tariffs prepared by licensees or applicants for transmission and storage facilities;
- NERSA can request licensees or applicants to amend the levels of tariffs or the tariff structure or both; and
- NERSA can approve or decide not to approve a tariff.

In regulating:

- NERSA will regulate the tariffs, if necessary, to ensure that NERSA is fulfilling its regulatory duties, *inter alia* by ensuring that tariffs are cost reflective and applied in a non-discriminatory manner.
- In this regard, ‘regulate’ is not limited to only ‘approving’ but it also extends to ‘controlling or governing’, ‘determining’ or ‘setting.’<sup>3</sup>
- However, the ‘setting’ part will become an obligation for NERSA when it is faced with the application of a recalcitrant licensee who is unwilling or unable to reconfigure its application in order to enable NERSA to approve its tariff upon reconsideration of the application.

The tariff application process is envisaged as follows:

- All licensees (or applicants, as appropriate) will be required to submit an application for tariff approval (a ‘tariff application’) to NERSA for the respective gas transmission and storage facilities concerned.
- For monitoring purposes, this application must be provided on an annual basis, although applicants are allowed to apply for approval of tariffs for a period of several years.

The Energy Regulator will request licensees to submit a tariff application based on their respective preferred methodology that may be chosen from the approved list of tariff methodologies. In addition, NERSA will specify and

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<sup>3</sup> See *Rex v Beerman and Another 1947 (2) SA 1029 (C) at 1030; De Beers Industrial Diamond Division (Pty) Ltd v Ishizuka 1980 (2) SA 191 (T) at 196D-F; and Phillipson-Stow and Others v Inland Revenue Commissioner [1960] 3 ALL ER 814 (HL)* on the wider meaning of the word ‘regulate’.

publish the preferred sources of information that must be used for tariff calculation input variables. The Energy Regulator will review each tariff application using the same methodology chosen and used by the tariff applicant and any other appropriate information or method for assessing the reasonableness of each application. This means that an applicant may use any of the provided methodologies, and that in the testing of the reasonableness of the application, the Energy Regulator may use the same methodology as well as other approaches. Alternative tariff methodologies or variations on the methods listed in the menu may be used by the applicant, provided that such method is proven, tested and verifiable.

Applicants must provide information regarding the parameters chosen and assumptions made in the tariff calculation, as well as the detailed calculations, for ease of assessment by the Energy Regulator before approval.

It should be noted that this method of ‘monitoring and approving and if necessary regulating’ provides ample room for project finance approaches to tariff determinations, as the main criterion for comparison and assessment is the resultant tariff outcome, not the method used in arriving at such a tariff. Moreover, a discounted cash flow approach is included as an approved methodology in the menu of tariff methodology options.

## **3.2 Tariff methodology approaches**

Licensees or applicants for transmission and storage tariffs will be able to choose the type of tariff methodology they wish to adopt. Below is a list of methodologies that the transmission and storage applicants or licensees can use to submit tariff applications.

### **3.2.1 *Rate of return regulation***

Rate of return regulation adjusts overall tariff levels according to the company’s efficient level of accounting costs and cost of capital. Rate of return regulation is based on the calculation of the revenue the company will be allowed to earn to cover its efficient operational expenses and to provide a return on its efficient level of investment in capital assets. This can be done for a single year or for a number of years (typically 3 to 5 years where a licensee opts for a multi-year application) or, in the case of new infrastructure, a longer term tariff

formula, logically constrained by the useful economic life of the facility and the licence period (e.g. for 20 to 25 years).

The components of the allowable revenue formula under the rate of return methodology are as follows:

$$\mathbf{AR = (RAB \times WACC) + E + T + D \pm C}$$

#### Where

**AR** = Allowable Revenue

**RAB** = Regulatory Asset Base inflation indexed original cost net of cumulative depreciation and cumulative amortization write-up for the period up to the commencement of the tariff period under review

**WACC** = Effective Weighted Average Cost of Capital (in real terms)

**E** = Efficient operating and maintenance Expenses

**T** = Tax expense

**D** = Depreciation for the tariff period under review, including Amortisation of the inflation write-up

**C** = 'Clawback/giveback' factor to correct for differences between actual variable values and the assumptions thereof used in the tariff calculation. This factor is typically applied with a 1 year lag in order for the licensee to submit the audited actual values for assumed values.

The allowable revenue calculated above should be divided by the gas volume projections to determine the tariff for the period. Licensees will need to motivate any gas volume projections lower than the latest actual volumes pertaining to a full year. In the absence of reasonable motivation, the Energy Regulator will accept the latest actual volumes as the minimum volumes or projection for the tariff.

It should be noted that all the components of allowable revenue are discussed in a generic manner in Section 4 of this document to allow licensees to use any of the elements in the methodology of their choice as they deem appropriate. Table 1 on page 17 provides an overview of how these components may be adopted for the various methodologies in the list.

### 3.2.2 Incentive regulation

#### Price Caps

An alternative approach for regulation is incentive-based regulation. Incentive-based regulation is aimed at providing incentives for efficiency increases and often involves setting of prices or revenues for a number of years (typically 3 to 5 years) into the future and including in those prices an 'efficiency factor' (a projected decrease in prices or revenues to incentivise the licensee to reduce costs).

Price Cap regulation is usually associated with CPI-X regulatory regimes, where CPI is an appropriate inflation index and where the X factor is an efficiency target.

The components of the price cap formula are as follows:

$$P_1 = P_0 * (1 + (I - X)) + K +/- Z$$

Where:

**P<sub>1</sub>** = new price

**P<sub>0</sub>** = current price (and the initial price is set using cost of service approach)

**I** = a measure of inflation or consumer price index

**X** = productivity/efficiency adjustment

**K** = correction factor to adjust for variations between estimated and actual values of variables such as the demand forecast

**Z** = an exogenous factor considered outside of the licensee's control.

#### Revenue Caps

An alternative version of incentive regulation is to apply a **revenue cap**, which is designed to provide a certain amount of revenue for the licensee. This is achieved by estimating the allowed revenue required by the regulated business (using the allowed revenue formula). The revenue cap differs from the price cap inasmuch as it provides the

licensee with protection against variations in demand that apply in the price cap. The licensee is generally allowed to earn its allowed revenue regardless of the level of demand.

The components of the revenue cap formula are as follows:

$$R_1 = R_0 * (1 + (I-X)) + K +/- Z$$

Where:

**R<sub>1</sub>** = Revenue Year 1

**R<sub>0</sub>**= Revenue Year 0 (initial revenue is set using cost for of service approach)

**I** = is a measure of inflation

**X**= is a productivity/efficiency adjustment

**K**= correction factor to adjust for variations between estimated and actual values of variables such as the demand forecast

**Z**= an exogenous factor considered outside of the licensee's control

### **3.2.3 Profit sharing and sliding scales**

Under profit sharing approaches, the licensee is allowed an appropriate level of profitability (based on the cost of capital approach described in Section 4.7 of this document). Any excess profits or losses relative to the allowed Weighted Average Cost of Capital (WACC) are then shared in pre-determined proportions between customers and the licensees.

The formula for a profit-sharing performance-based methodology will contain the following components:

- a starting point allowable revenue or tariff (established using the rate of return method);
- a performance-based revenue formula to establish allowable revenues in subsequent years that are indexed to some measure of inflation and productivity/efficiency (similar to revenue cap above);
- a mechanism by which allowable revenues or tariffs are adjusted to account for changes in the cost of capital, usually called a 'cost of capital trigger' mechanism;
- some type of revenue or earnings sharing component, whereby

customers and the licensee share the excess of actual revenues over allowable revenues; and

- 'Z-factors' and similar exclusions to account for highly unusual events and costs that are not within the control of the licensee.

#### **3.2.4 *Hybrids of the abovementioned approaches***

Under a hybrid scheme, the regulator combines a price cap or rate of return mechanism with a revenue sharing or other mechanism that uses realised earnings to determine prices. The most common type of hybrid price cap is one where the regulator approves a price cap formula and an explicit earnings-sharing requirement through which any additional earnings are divided between the licensee and customers using a pre-determined formula.

#### **3.2.5 *Discounted Cash-Flow***

The discounted cash-flow approach to tariff calculation is based on the use of project finance-based financial modelling to determine the appropriate tariffs for transmission and storage facilities. Allowable revenue for transmission or storage facilities is calculated based on projected expenditure, capital investment and discount rates using the allowed revenue formula. These allowable revenues are then used in a financial model of the transmission or storage facility's cash flows to assess whether the business is financially sustainable.

This assessment is based on a range of financial performance indicators, for instance whether the transportation or storage business is able to meet a target hurdle rate, i.e. a target range of Internal Rate of Return (IRR), or some target Interest Cover Ratio or Debt Service Cover Ratio (DSCR) in order to attract investment.

### **3.3 General application**

The methodologies outlined briefly above would also require a reward or penalty system as an incentive to maintain or improve licensee service, safety, and customer satisfaction performance compared to established benchmarks.

Licensees or applicants may apply for a tariff for more than one year, logically constrained by the useful economic life of the pipeline or storage facility, depending on the specific circumstances. The period of application notwithstanding, such long-term tariffs will remain subject to monitoring and the other requirements of the Gas Act.

In addition, so-called ‘Z-factors’ are often included to account for highly unusual or exogenous events and costs that are not within the control of the licensee and hence are inappropriate for performance-based regulation.

Lastly, any tariff methodology will be subject to monitoring and evaluation by the Energy Regulator.

## 4 Components of Allowable Revenue (AR)

### 4.1 Introduction

Each of the regulatory methodologies considered in Section 3 require the calculation of an allowable revenue for each year under consideration. In this section, the calculation of some of the elements of the allowable revenue, as summarised in the following table, will be discussed.

Table 1: Tariff methodology elements

<b>Methodology/ Component of Allowable Revenue</b>	<b>Rate of Return Regulation</b>	<b>Incentive Regulation</b>	<b>Profit sharing/ Sliding scale</b>	<b>Hybrid</b>	<b>Discounted Cash flows</b>
<b>Efficient O&amp;M expense (Bottom-up)</b>	✓	✓	✓	✓	✓
<b>Flow through tax<sup>1</sup></b>	✓	✓	✓	✓	✓
<b>Straight-line depreciation</b>	✓	✓	✓	✓	✓
<b>TOC for RAB Valuation<sup>2</sup></b>	✓	✓	✓	✓	✓
<b>CAPM &amp; Real cost of equity</b>	✓	✓	✓	✓	✓
<b>Real cost of debt<sup>3</sup></b>	✓	✓	✓	✓	✓
<b>Real WACC<sup>3</sup></b>	✓	✓	✓	✓	✓
<b>Inflation CPI/PPI</b>	✓	✓	✓	✓	✓
<b>Financial Indicators</b> e.g. hurdle rate, DSCR, Interest Cover					✓
<b>Correction Factor</b>	✓ = C	✓ = K	✓ = cost of capital trigger	✓ = pre- determined formula	✓ = financial indicators trigger
<b>Cost of Service for initial <math>P_0/R_0</math></b>		✓			
<b>Allowable Revenue</b>	✓ = AR	✓ = $P_1 * \text{Volume} = R_1$	✓	✓	✓

Note 1: See section 4.3 for exceptions to use Normalized tax approach; Note 2: See section 4.4 for exceptions regarding 100% TOC versus trending of equity financed portion of asset; and Note 3 see section 4.4 for exceptions regarding applying real Ke on equity funded portion of assets versus use of real WACC on 100% on full asset base.

In order to ensure a systematic approach to tariff approval, the Energy Regulator will use Rate of Return elements in addition to the applicant's chosen methodology to assess the reasonableness of each application. For instance, the standard (i.e. textbook) DCF method does not cater for a clawback calculation or an allowance for funds used during construction. Hence, while an application can be made using the standard DCF for tariffs, NERSA will use elements of Rate of Return regulation to perform reasonableness tests in order to monitor and approve the tariffs.

## **4.2 The efficient level of operating and maintenance costs (Opex)**

### **4.2.1 Data for monitoring Expenses**

The Operating and Maintenance (O&M) cost efficiency analysis will be based on:

- NERSA receiving operating cost projections from the regulated transmission or storage licensee;
- NERSA forming a view as to the efficient level of maintenance and operational expenditure; and
- the revised operating and maintenance costs based on NERSA's view being included in the Allowable Revenue calculation.

Operating and Maintenance cost data for tariff determinations should be provided in a form consistent with that laid out in the Regulatory Reporting Manuals prescribed by NERSA<sup>4</sup> to facilitate comparisons between actuals and projections over the tariff period. The provided costs should be such that there is a clear separation of storage from transmission activities and between individual pipelines as prescribed. In addition, the following should be noted:

- Allowable expenses relate to all expenses that are incurred in relation to the regulated services. These costs include normal operating expenditure, maintenance (excluding refurbishment costs that must be capitalised), manpower or labour costs, and overheads, as stipulated in the Regulatory Reporting Manuals.
- Operating expenses referred to as 'other costs' must be unbundled.

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<sup>4</sup> NERSA [2008]: Regulatory Reporting Manual Volume 3: Piped-Gas (effective 01 September 2008).

- Litigation costs incurred in the production of income in accordance with South African Revenue Services rules are allowed. The costs of litigation arising from the transgression of laws by the licensee are not allowed.
- Research and development expenses are permitted, subject to adequate justification.
- The following are examples of expenses that may be considered by NERSA as unjustified expenses. NERSA will scrutinise these expenses on a case-by-case basis and consider whether these costs benefit tariff paying customers. The list of expenses is not exhaustive, but are indicative of costs that may not be allowed into the allowable revenue calculation.
  - advertising and sponsorship services; golf day and fair expenses;
  - value adjustment, exceeding the amount of 1% of total operating revenue of the operator;
  - occasional awards;
  - annual awards to the members of the Management Board;
  - costs of life insurance premiums, in the total amount;
  - entertainment expenses;
  - internal representation and publicity expenses;
  - gifts (donations);
  - fines, penalties, compensation for damages and expenses arising from the contract, in the total amount;
  - expenditures such as write-offs of tangible and intangible assets if the subject assets are replaced by new assets entered into the regulated assets; and
  - BEE and other CSR costs.
- The provision for land rehabilitation or decommissioning costs must be applied for and collected separately. These funds must be kept in accordance with section 34(1)(d) of the Gas Act and regulations 11(4) and 11(5), which require licensees to provide for security in respect of rehabilitation obligations.

#### **4.2.2 An approach to determining efficient operating and maintenance costs**

To effectively monitor pipeline tariffs on a pipeline-by-pipeline basis or for individual storage facilities, at any point during the lifetime of the facility, NERSA may undertake an assessment of the efficient level of operating and maintenance expenditure by licensees.

The Energy Regulator may use the ‘bottom up’ approach to assess the efficient level of O&M expenses in transmission and storage activities.

The bottom up assessment is typically based on the regulator appointing a suitably qualified expert to review the data provided by the licensee and to conduct interviews with the licensee to identify opportunities for cost reduction.

A top down benchmarking approach to efficiency assessments may also be used to complement the bottom up assessment.

#### **4.2.3 Considerations in efficient O&M expenses**

A number of other factors will be considered by NERSA in assessing the O&M expenses incurred by licensees. These include the following:

- Expenses must be prudently and efficiently incurred. In assessing whether the expense was prudently and efficiently incurred, NERSA will consider the following factors:
  - determination if the expenses were arm’s length bargaining;
  - expenses must be legitimate for providing regulated services;
  - the costs should be incurred through efficient company processes;
  - expenses should represent the normal operations of the licensee and may be adjusted for pending increases or decreases; and
  - expenses that will not be allowed by other commissions or authorities.
- NERSA may undertake prudence checks on the efficiency of the expenses, including using the previous year’s actual values as a benchmark. NERSA may also use another internationally acceptable standard to test the reasonableness of the escalation indices to be applied in the following tariff application or period.
- In incentive regulation, such as CPI-X regulation, the X factor is referred to as the efficiency factor. This efficiency factor is likely to be different from a simple target set for O&M expenses reduction for a number of reasons, including that the X factor represents the change in tariff therefore taking into account total efficiency (e.g. capital efficiency as well as O&M expense efficiency); and often the X factor is calculated to smooth the tariff over a number of years,

which does not specifically reflect operating cost efficiency in any particular year.

#### 4.3 Determining TAX (T)

Tax refers to a licensee's estimated tax payable to the tax authority with respect to taxable allowable revenue from the regulated activity for the tariff period under review.

NERSA allows the licensee a choice between the flow-through and normalised tax approaches. However, once a licensee has chosen an approach, it is not permitted to change. However, the flow-through tax approach is the Energy Regulator's preferred tax methodology.

The flow-through (of taxes payable) approach is an approach whereby only current income taxes payable are factored into the allowable revenue and recovered in the tariff during the period under review. In this flow-through of taxes payable method, it is not necessary to provide for future income taxes (deferred taxes), since there is a reasonable expectation that future taxes payable will be included in future costs of service and provided for in allowable revenues at that time.<sup>5</sup> Thus, in applying the flow-through of taxes payable approach, income taxes payable are estimated for the tariff period under review based on taxable income as opposed to accounting income.

To derive the taxable income (as opposed to accounting income), the licensee is obligated to maximise all eligible deductions for income tax. Differences between the estimated flow-through tax at time of the tariff application and actual flow-through taxes paid will be adjusted through the appropriate +/- correction factor contained in the tariff methodology chosen by the licensee. The formula that will be used to assess the flow through tax is as follows:

$$\text{Tax} = \{(\text{NRBTA})/(1-t)*t\}$$

Where

$$\begin{aligned} \text{NRBTA} &= \text{Net Revenue Before Tax Allowance} \\ &= \{(RAB*WACC) + E + D(\text{historic} + \text{write up}) +/-C\} - \{E + D(\text{historic}) + Kd (\text{nominal})\} \end{aligned}$$

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<sup>5</sup> The taxes payable method of accounting for income taxes is used for tariff setting purposes for Canadian natural gas transmission operations.

T = Prevailing Corporate Tax Rate

Although the flow-through tax methodology is preferred, the Energy Regulator may, upon request, allow a licensee to use the normalised<sup>6</sup> tax approach under one of the following conditions:

- Where a licensee has been using the normalised tax approach in the past and has obtained approval from the Energy Regulator to continue using this approach. In this case, the deferred taxes are deducted from the Regulatory Asset Base (RAB) because the licensee would have collected the funds necessary to meet its deferred tax liability obligations in its tariff in advance. In addition, the licensee must maintain adequate records for the assets creating the deferred tax liability and the tariff application must include a schedule disclosing the year-on-year deferred tax liability and expected year-on-year reversal of the deferred tax liability until the time that such a deferred tax liability ‘zeros out’.
- Any other licensee wishing to use the normalised tax approach must motivate to the Energy Regulator before using the normalised approach and provide sufficient undertakings that detailed records must be kept as indicated, as well as proof that sufficient funds will be set aside to be available in the later years to pay the taxes when the deferred taxes start reversing.

With regard to the flow-through tax approach, its main advantage is the avoidance of the over-recovery of corporate tax payments by the regulated entity. The extent of the over-recovery can be significant, particularly for major assets that have economic lives extending many decades.

It must be emphasised that the flow-through approach does not take away the tax benefits from an accelerated wear and tear allowance envisaged by the tax authorities. The difference is in the timing. When a company accelerates the depreciation of asset in accordance with tax laws, more depreciation is recorded in the first few years of the asset’s life, and less in the later years of the asset’s life, relative to regulatory depreciation.

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<sup>6</sup> The normalized tax approach is a method in which a licensee collects more revenue from tariff payers to cover its tax obligation early in the life of a depreciable asset than the licensee is obliged to pay in taxes in the early tariff period(s). This arises from the fact that the licensee would ordinarily use a straight-line depreciation method to determine depreciation expenses charged against operating income for tariff making purposes while in contrast, *accelerated* depreciation deductions are permitted by the tax authority for determining corporate income taxes. Deferred taxes for this asset are built up in a deferred tax account, and then drawn down to zero over the asset’s life as lower tax charges during the asset’s early years are followed by higher taxes during its later years. The fundamental aspect of ‘normalization’ accounting is that the deferred tax account must ‘zero out’.

Cumulative tax and regulatory depreciation are generally equal over the course of an asset's life.<sup>7</sup>

The main disadvantage of the flow-through approach is the potential complexity arising from calculating the accelerated depreciation allowances for each of the regulated entity's assets. This calculation, to some extent, would also be required under the notional tax approach for the calculation of the deferred tax assets and liabilities, which are added to/deducted from the RAB. However, deferred tax assets and liabilities are reported separately in statutory accounts, making it possible to obtain these values without detailed calculations.

The advantage/disadvantage of the normalised tax approach is the inverse of the advantage/disadvantage of the flow-through approach described above, i.e. it is simple to administer, but allows for the over-recovery of the taxation allowance in the early years of an asset's life. In addition, given that the tax allowance is calculated with reference to straight line depreciation, the normalised approach allows for a more smoothed tariff profile compared to the flow-through approach.

#### **4.4 Calculating returns – the Regulatory Asset Base (RAB)**

The key principle for setting a regulatory asset base value is to ensure that the investment in assets receives an appropriate level of reward to recoup the investment and earn a return commensurate with risk. At the same time, this requires the WACC to be set at an appropriate level for an adequate 'return on capital'. In addition, setting the asset value correctly for the calculation of depreciation is fundamental to ensuring that an appropriate level of funds is available for a 'return of capital' towards the eventual replacement of those assets.

##### **4.4.1 Prudency Assessment**

NERSA will perform prudency tests on the investment to be included in the RAB for the tariff determination. Prudency means that the investment is reasonable based on cost-minimisation to avoid

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<sup>7</sup> Edison Electric institute, 2013, 'Comprehensive Tax Reform Priorities: Maintain Normalization Rules', available: <http://www.eei.org/issuesandpolicy/finance/Documents/Maintain%20Normalization%20Rules.pdf>.

unnecessary over investment. When determining prudence, the following assessment will be undertaken:

- The investment is prudent if it was prudent at the time the decision was made. Meaning that this requires accurately assessing what information management had available and used to make its decision.
- The investment is prudent if management acted to minimise cost by fully considering the changing conditions that would affect the investment. This requires assessing what management should have known and should have considered in making this decision.
- Aligned to prudence is the used and useful concepts. Used and useful means that the plant is actually being used to provide a service and that it is contributing to the provision of the service.

#### **4.4.2 Determining the value of the Regulatory Asset Base (RAB)**

The value of the regulatory asset base is the inflation-adjusted historical cost or trended original cost (TOC) of plant, property and equipment less the accumulated depreciation at the commencement of the period under consideration plus the net working capital. The following formula may be used to determine the value of the regulatory asset base:

$$\text{RAB} = \text{V} + \text{AFUDC} - \text{d} + \text{w}$$

##### **Where**

**V =** Value of used and usable regulated property, plant, vehicles and equipment at commissioning date, indexed by TOC plus the Allowance for Funds Used During Construction (AFUDC).

**AFUDC=** Allowance for Funds Used During Construction. This refers to the recovery of costs incurred by a licensee during construction of a licensed facility. It includes the net cost for the period of the construction of the borrowed funds and a reasonable rate of return on funds such as equity, when so used. The amount should not exceed, without the prior approval of the Energy Regulator, allowances computed in accordance with the formula prescribed below

**d =** accumulated depreciation at the commencement of the tariff period under review

**w =** net working capital

The trending can be done for the entire asset base if the so-called 'patient equity capital' approach is used. However, if there are assets that are funded by debt, then the licensee can opt to only trend the equity financed proportion of the asset base.

#### **4.4.3 Value of Property, Plant, Vehicles and Equipment (V) using TOC**

The value of used and usable property, plant, vehicles and equipment comprises only non-current assets used in the regulated activity.

The RAB must be adjusted for capital additions upon commissioning of the assets concerned. This is the approach used by regulators when capital additions occur infrequently. Should additions occur frequently and in small increments, the RAB on which return for any given year is calculated can be calculated by averaging opening and closing balances:  $[(RAB_{t-1} + RAB_t)/2]$ .

Inflation adjustments must be based on appropriate inflation indices as approved by the Energy Regulator. The same inflation index CPI used in trending will be applied in adjusting the nominal return on equity/nominal WACC to real rate of return on equity/real WACC and vice versa.

The full asset base will be trended for inflation if the 'patient capital' approach is used. If however the debt is treated as a pass-through, then only the equity-financed portion of the assets is trended, as explained below. Of these two approaches, the 'patient capital' approach is preferred to avoid asset abandonment.

Non-current assets must be calculated for each asset category and added to arrive at the value for V using the TOC valuation method as follows:

- The Starting Regulatory Asset Base (SRAB) will be determined using depreciated original cost. Where original cost does not exist, then the SRAB should be determined as prescribed in the Regulatory Reporting Manuals.
- The SRAB for existing assets determined as explained above becomes the proxy for original cost to be trended for the future.

- In the so-called ‘patient capital’ approach, the equity investor takes the risk by getting less of its return upfront, but more return later (e.g. from year 8 as per the attached example 1).

In the patient capital approach:

- The equity holder is entitled to full trending of the asset base for both the debt and the equity-financed asset portion.
- The real WACC that combines both debt and equity as per the capital structure financing the asset will be applied to the Trended RAB.
- The real WACC times the total regulatory asset base yields the yearly allowed total return on assets in Rands.
- The inflation factor multiplied by the total regulatory asset base yields the regulatory asset base write-up for inflation (adjustment) to be added to the RAB balance carried forward to the next tariff period.

In the cost of debt pass-through approach, the equity holder has not taken as much risk since the full debt costs are a pass through. Hypothetical debt costs will not be considered in this approach as this would not enable a like for like comparison with the Regulatory Financial Reports. Hence if a licensee opts to use the debt pass through approach, it must use its actual debt profile in the calculations.

Under this approach, the following applies:

- It is required to trend the equity portion only in order to ensure that the equity holder will not benefit from an inflation adjustment or inflation ‘write-up’ of the rate base with respect to assets financed by debt.
- The equity holder will only be compensated for the inflation to the extent that assets are financed by equity. The real cost of equity (not WACC) will be applied to the trended equity-financed portion of RAB.
- The real rate of return on equity (not WACC) times the equity share of the regulatory asset base yields the yearly allowed return in Rands.
- The inflation factor multiplied by the equity share of the regulatory asset yields the regulatory asset base adjustment (write-up) added to the RAB balance carried forward to the next tariff period.

- In determining the proportion of equity-funded assets to be trended, the capital structure should be representative of the regulated business' risk, and therefore the actual capital structure must be used.
- However, the Energy Regulator may use an 'optimal' or 'deemed' capital structure in order to provide incentives for efficient financing.
- Where debt cost is a pass through, both the interest as well as the difference between depreciation of debt-financed asset and the actual debt principal are allowable as a pass-through in the tariff through a calculation to achieve the desired debt service cover ratio (DSCR).
- The write-up or adjustment is, similar to depreciation, written off or amortised over the useful life of the asset. Prior periods' write-ups will be excluded from the tariff calculation because a nominal rate of return, which included inflation, has already been earned by the licensee.

The Energy Regulator intends to implement this approach based on depreciated original cost or, in the absence of original cost, as prescribed in the Regulatory Reporting Manuals. The annual change in the asset value with this approach is equal to the value of net (expected) new investment during the year.

#### **4.4.4 General provisions**

The provisions below provide guidance regarding the treatment of assets in the tariff methodology:

- plant, property and equipment under construction are excluded from the Regulatory Asset Base;
- non-current assets must be used and usable, of a long-term economic lifespan and in a condition that makes it possible to be used in the short term;
- capital expenditure is admitted to the Regulatory Asset Base when the asset concerned becomes used and usable, i.e. is 'commissioned';
- other costs of an extraordinary nature, for example major storm damage repairs not covered by insurance, may be included in the Regulatory Asset Base if the licensee decides to capitalise these costs;

- funds deposited by customers with the licensee are excluded from the Regulatory Asset Base;
  - contributions received in lieu of connection charges representing non-refundable funds contributed by customers are excluded from the Regulatory Asset Base;
  - where a normalized tax approach is applied, the deferred tax collected from tariff payable earlier than the licensee currently must pay in taxes is deducted from the Regulatory Asset Base;
  - leasehold improvement constitutes an investment in a right-to-use property and is admitted to the Regulatory Asset Base;
  - non-current assets expected to become used and usable during the forthcoming tariff period (i.e. one year) are admitted to the Regulatory Asset Base in proportion to the share of the forthcoming tariff period during which they will be used and usable, however if a difference occurs between the expected share of the asset and the actual share of the asset that has become used and usable during the year under review, then a clawback or giveback is made in the year following the submission of the audited financial and regulatory accounts; and
  - plant equipment (spares) held for emergency stores for security of supply (if not already included in working capital) are allowed for inclusion in the Regulatory Asset Base and depreciated at a rate specific to its respective asset class.
- This approach also provides for the classification of the assets used in the Compressed Natural Gas industry, as well as guidance on treatment of Liquefied Natural Gas and distribution assets in the allowable revenue.
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#### **4.4.5 Regulatory assets/liabilities**

Regulatory assets/liabilities result from a tariff approval decision in a particular period that results in an allowable revenue that differs from the amount that would have been allowable if the full allowable revenue was earned in that same period. See excerpt from the Regulatory Reporting Manuals below:

### **145 Regulatory Assets**

*This account shall include the amounts of regulatory-created assets, not included in other accounts, resulting from the ratemaking actions of the Energy Regulator.*

*The amounts recorded in this account are to be established by those charges which would have been included in net income, determinations in the current period under the general accounting norms are being deferred and to be included in a different period(s) for the purposes of developing rates that the Licensee is authorized to change for its regulated services. The amounts recorded in this account are generally to be changed, concurrently with the recovery of the amounts in rates, to the same account that would have been charged if included in income when incurred.*

Regulatory Assets are 'deferred' allowable revenue or income. Hence the licensees should provide the Energy Regulator with a calculation of the allowable revenue according to the chosen methodology (using the estimated volume projection for instance) for the relevant tariff periods, so as to determine the regulatory asset to be raised in the accounts, that will be included in future tariff periods (i.e. over the entire multi-year tariff period). The Energy Regulator may request licensees to defer a portion of their allowable revenue (for instance, this may be deferred investment costs or deferred operational costs) to later years in both multi-year and one-year tariff applications as well, because the licensee will still need to ramp up the volume.

As illustrated by the example shown in Table 2 below, the licensee is entitled to allowable revenue over the lifetime of the asset of a certain value in real terms. If, during the ramp-up of the facility, the actual volumes are lower than average for the lifetime of the asset, the Energy Regulator may request the licensee to defer some of this allowable revenue to a later year in the multi-year tariff period (indexed with inflation) so as to smooth the tariffs and to arrive at a stable real tariff path. This deferred income must be recovered during the multi-year tariff period that the licensee has applied for or in successive tariff applications in the case of a one-year application that is not yet fully ramped up, but the licensee expects to reach full capacity within a foreseeable period in the future.

**Table 2: Example**

	Year 1	Year 2	Total
<b>Allowable revenue (Rands)</b>	50	50	100
<b>Volume (GJ)</b>	25	75	100
<b>Tariff according to methodology (Rands/GJ)</b>	2.00	0.67	
<b>Adjusted allowable revenue (Rands)</b>	25	75	100
<b>Adjusted tariff (Rands/GJ)</b>	1.00	1.00	

In Table 2 above, the total allowable revenue is R100 over 2 years. The total project volume is 100 GJ, so that in constant terms, R100 must be recovered over 100 GJ, which yields an average tariff of R1. By charging R1 per GJ in year 1, a total of R25 revenue is earned, while a total of R75 is earned in year 2. Half of the allowable revenue is recorded as a regulatory asset in year 1, and a liability of the same amount is raised in year 2. Please note that in the example real values are used for clarity purposes, thereby removing the inflation write-up that would be applied to the year 2 regulatory assets that is part of the adjusted allowable revenue.

A licensee can calculate the levelised cost of the infrastructure and calculate stable tariffs in real terms over a longer time frame. Actual tariffs will be inflated when being implemented.

#### **4.4.6 The treatment of cross-border assets**

A cross-border asset is an infrastructure project with activities spanning two or more countries, one of which is the Republic of South Africa, or a domestic infrastructure project that has significant cross-border impact.

The costs of cross-border assets can equitably be allocated on the basis of the 'Beneficiaries Pay' principle. The beneficiary pays principle entails that each country is allocated the share of the costs based on capacity reservation on the asset. This applies to greenfield projects as well capacity additions.

Licensees will be required to provide an assessment of the benefits of the project, and the allocation of costs to the different beneficiaries based on the assessment. In particular, the following is relevant:

- The benefits of the project should be clearly laid out, which may include capacity enhancement, congestion reduction or other benefits. Where possible, these benefits should be quantified, for example, the project will increase the capacity of the transmission pipeline by 1 million GJ per annum.
- The beneficiaries of the project should be clearly identified indicating the benefits and how much of the benefits will accrue to each beneficiary. For example, the beneficiaries of the project are Company X supplying customers in Country X and Company Y supplying customers in Country Y. 50% of the increased capacity has been reserved by Company X and therefore 50% of the capacity has been allocated to Company X.
- The costs of the project should be clearly laid out, including capital expenditure, operational and maintenance expenditure over the technical lifecycle of the project and decommissioning and waste management costs.
- Where significant benefits of the project cannot be quantified but should impact on the cost allocation, NERSA will assess whether the cost allocation is fair and comports to the principle of the beneficiary pays.
- Based on the assessment of the benefits and beneficiaries of the project, the costs should be allocated accordingly.

Documentary evidence detailing the analysis undertaken by the licensee should be provided to support this assessment.

NERSA will treat cross-border asset cost allocation by taking into account the following criteria:

- The investment cost must be prudently and efficiently incurred.
- The cost of the cross-border asset that will be allowed to be included in the RAB of the licensee will be reflective of the capacity reserved for the domestic market. This will ensure that one country does not subsidise the capacity reserved for another country and also ensures fair allocation of cost. For instance the cost of cross-border transmission pipelines with off-takes in both countries involved, would be split according to the capacity reserved for or utilised by each country's off-take. The estimate of the relative use

of the pipeline by both countries must be indicated in the tariff application and may be subject to a clawback/giveback provision in a case of substantial deviation between the estimated and actual usage split. Similarly, in the case of capacity additions to existing cross-border infrastructure, the cost for the additional capacity would be split according to the capacity reserved for or utilised by each country's off-take.

- It is acknowledged that country risk premia differ between countries and this is particularly important for cross-border assets. As many infrastructure assets are in fact interdependent and indivisible in nature, country risk premia applied to the cost of capital will be that of the highest risk-premium country. This will ensure that the allowable revenue component is adjusted to reflect the country risk that the project as a whole is exposed to.
- The decommissioning costs for the asset that is located outside the border of South Africa will be split according to the capacity reserved or utilised between the two countries. This approach is aligned to the treatment of capital costs (RAB) that which gave rise to the need for decommissioning cost. Capital costs including decommissioning costs will be split between countries in proportion to capacity reservation.
- The tax treatment of the cross-border assets will be aligned with the RRM principles and tax laws, including tax treaties. According to SARS, resident companies are taxed on world-wide income and non-residents are taxed on income sourced from South Africa. For cross-border assets that are owned by a South African registered company, the entire tax relating to the asset will be included in the allowable revenue at the South African tax rate. For a non-resident company, only the part of the cross-border asset that caters for capacity that is earmarked for the South African market will be included in the allowable revenue at the South African tax rate and the foreign share will be included at the relevant foreign tax rate. The split of the tax dues will be according to the cost allocation principles applied for.
- Unutilised capacity costs will be allocated pro rata, in accordance with the cross-border cost allocation mechanism outlined above.
- NERSA may conduct a review of the reserved capacity assumptions periodically so that should the capacity reservation profiles change, the costs can be re-allocated.

The underlying principle in terms of cross border assets is to ensure that asset costs are shared fairly between countries in line with benefits accrued and risks faced by the countries involved.

#### **4.4.7 Allowance for funds used during construction**

The Regulatory Reporting Manuals provide guidance on the Allowance for Funds Used During Construction (AFUDC).<sup>8</sup> NERSA's proposed approach as outlined below is consistent with this guidance.

The AFUDC refers to the recovery of costs incurred by a licensee during construction of a licensed facility. It includes the net cost for the period of the construction of the borrowed funds and a reasonable rate of return on funds such as equity, when so used. The amount should not exceed, without the prior approval of the Energy Regulator, allowances computed in accordance with the formula prescribed below.

The costs should have been incurred on a continuous, planned and progressive basis. The Energy Regulator suggests that the licensee inform the Regulator of potential costs prior to the tariff application. Preferably, the applicant should state the costs when the application for a construction licence is submitted.

The formula and elements for the computation of the allowance for funds used during construction shall be the approved weighted average cost of capital multiplied by the sum of the following:

- average balance in construction work in progress (CWIP);
- plus average capital inventory balance;
- less construction accounts payable; and
- less asset retirement costs (if included in the CWIP).

The weighted average cost of capital rate shall be determined in the manner indicated and approved by NERSA for the applicable year. The resulting amount should be added to the allowable revenue. The AFUDC may, if so directed by the Energy Regulator, be prorated over the appropriate depreciable plant accounts.<sup>9</sup>

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<sup>8</sup> NERSA. 2008. Regulatory Reporting Manual Volume 3: Piped Gas, pg. 15-16

<sup>9</sup> NERSA. 2008. Regulatory Reporting Manual Volume 3: Piped Gas, pg. 19

The formula for the AFUDC is calculated as follows:

$$\text{AFUDC} = \text{WACC} \times [\text{Average CWIP} + \text{Average capital inventory balance} - \text{Construction accounts payable} - \text{Asset retirement costs}]$$

Where:

WACC = Weighted Average Cost of Capital

Average CWIP =  $\{(\text{Opening CWIP balance} + \text{Closing CWIP balance})/2\}$

Average capital inventory balance =  $\{(\text{Opening balance} + \text{Closing balance})/2\}$

As the definition of the RAB includes the AFUDC value, it should not be multiplied by the WACC in isolation, but the amount over which the allowance may be earned must be added to the RAB, after which the WACC \* RAB value is calculated over the entire value of the RAB including the amount for the AFUDC.

The Energy Regulator will consider the following rules in deciding whether to allow the AFUDC to be included as part of the allowable revenue:

- For AFUDC to be allowed, the licensee should demonstrate to the Energy Regulator's satisfaction that the capital expenditure on the project has been incurred and that the activities required for construction completion of the assets are in progress.
- The activities allowed under AFUDC exclude a return on funds used during the preliminary survey and investigation activities required to prepare the construction project for its intended use, unless they are capitalised in accordance with acceptable accounting principles.
- Capital expenditures must have been incurred prudently.
- The company must also retain the records supporting the commencement of AFUDC accruals.
- Piped-gas companies must show that the 'activities', that are necessary to get the construction project ready for its intended use are in progress.
- No AFUDC should be accrued during periods of interrupted construction unless the company can justify the interruption as being reasonable under the circumstances. Capitalisation of AFUDC stops when the facilities have been tested and are placed

in, or are ready for, service. This would include those portions of construction projects completed and put into service although the project may not be fully completed.

- When only part of the plant or project is placed in operation or is completed and ready for service, but the construction work as a whole is incomplete, that part of the cost of the property placed in operation or ready for service, shall be treated as a gas plant in service and AFUDC as a charge to construction should cease. AFUDC on the part of the cost of the plant that is incomplete may be continued as a charge to construction until such time as it is placed in operation or is ready for service.
- No AFUDC will be included for projects where a 100% contribution has been received up front on a direct assigned project. For those projects where contributions are received up front and no AFUDC is calculated, the contribution would be included in the rate base in the same period as the asset.
- The AFUDC accruals will be subject to scrutiny through audit as well as during the tariff application. Once the project is completed and commissioned, the AFUDC accruals have to cease.

#### **4.5 Depreciation (d) and amortisation**

Accumulated depreciation is the cumulative depreciation against plant property, vehicles and equipment in service. It is calculated on a straight line basis over the economic life of the asset. Depreciation can be calculated on the historical (original) cost of the asset. The inflation write-up from the trending of the asset value is treated in a similar manner to the depreciation of the historical cost and amortised over the remaining economic useful life of the asset.

#### **4.6 Net Working Capital (w)**

Net working capital refers to various regulatory asset base funding requirements other than utility plant in service. These funding requirements include inventories, prepayments, cash working capital and other non-plant operating requirements. Working capital funded by investors may be included in the regulatory asset base.

The following formula may be used to determine net working capital:

**Net working capital = inventory + receivables + operating cash – trade payables**

The calculation method for inventory should be consistent with that included in the Regulatory Reporting Manuals.

Operating cash refers to the amount of investor-supplied funds needed to finance operations. This is finance to bridge the gap between the time expenditures are made to provide service and the time collections are received for that service. It is the cash supplied by investors to finance operating costs during the time lag before revenues are collected. Measurement of the required operating cash must be based on the licensee's standard practice subject to a maximum 45 days' operating expenses, excluding depreciation. To claim a provision for operating cash for more than 45 days, the licensee must submit a lead-lag study demonstrating the difference between receivables and payables.

Receivables refer to current assets for which the amount to be received is usually known and is to be included in the net working capital calculation, based on an amount for between 30 and 45 days.

Trade payables refer to current liabilities for which the amount to be settled is usually known and is to be included in the net working capital calculation to a maximum of 45 days.

The Energy Regulator will expect licensees to observe optimal working capital management practices such as timely collections and minimizing uncollectible (bad debts) and abnormal inventory losses/unaccounted for gas in accordance with international standards.

#### **4.7 Weighted Average Cost of Capital (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 that 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.

As providers of equity and debt are interested in the post-tax returns available to them, when determining the allowed revenues and tariffs, NERSA must allow not only for the post-tax WACC return, but must also allow for corporate taxation

that will be incurred by the regulated company. 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.

Pipeline and storage companies will be expected to submit their WACC expectations 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, the Capital Asset Pricing Model (CAPM) can be used for the cost of equity.

Besides CAPM, a licensee is allowed to opt for the use of any other internationally accepted methodology to estimate the cost of equity, provided that such methodology must be supported by expert testimony from credible financial sources. Quotations or estimates from different lenders could provide further justification.

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

$$\text{Post-tax WACC} = \left[ \left( \frac{E}{Dt + E} \right) * Ke + SSP \right] + \left[ \left( \frac{Dt}{Dt + E} \right) * Kd \right]$$

Where:

**E** = Equity

**Dt** = Debt

**Ke** = the Cost of Equity in terms of the Capital Asset Pricing Model (CAPM)

**SSP** = Small stock premium is calculated based on the approach outlined below

**Kd** = is the post-tax rate of return on Debt capital

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, applicants have the option to submit an application based on any other internationally recognised and used cost of capital approaches. Companies are expected to provide a rationale for the approach used, and this will be assessed by NERSA on a case-by-case basis.

When tariffs are considered by NERSA, the tariff level will be set to ensure that appropriate levels of financial indicators will be met, based on prevailing financial market conditions and best practice.

If the CAPM is adopted for the calculation of WACC, one of the key components that will need to be estimated is Beta, which will be discussed below.

As much regulatory certainty can be provided by narrowing down the range of acceptable input variables, NERSA will publish preferred sources of information for the key input variables discussed in the remainder of this section. These sources of data will be subject to stakeholder comment and will be determined and revised by the Energy Regulator from time to time.

### **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:

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

#### **Where**

**r(f) = The risk-free rate**

It represents the return an investor can achieve on the least risky asset in the market, i.e. government bonds. In particular, the spot prices of South African government bonds with a maturity of at least 10 years should be used for the expected risk free return when estimating the cost of equity.

**$\beta(e)$  = The equity beta**

This 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 are provided below.

**MRP = The market risk premium**

This represents the additional expected return investors require to invest funds into equities rather than risk-free instruments. It should be calculated using the arithmetic

mean of the returns on the Johannesburg Stock Exchange All Share Index for a period of 30 years.

The NERSA-preferred sources of information for input variables, to be determined from time to time, will provide clarity on the appropriate sources to be used for  $r(f)$ ,  $\beta(e)$  and MRP.

## **Beta**

Beta ( $\beta$ ) is the systematic risk parameter for regulated entities providing transmission and storage. 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. International pipeline companies can be used as a proxy for gas transmission and storage licensees. Licensees supplying compressed natural gas can use international compressed natural gas companies as well as those supplying compressed natural gas for use in vehicles as proxies. The companies used as proxies by licensees should be listed on stock exchanges. A total of six international companies should be used to determine the equity beta. The companies included as proxies need to be approved by NERSA. Licensees can calculate the beta based on the weekly previous two years data. The beta will be applied for the duration of the tariff period.

To make adjustments for differences in gearing between the proxy and the licensee, the process involves '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; and
- 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:

$$\beta_{a1} = \frac{\beta_1}{1 + [1 - Tr] * \left[ \frac{D}{E} \right]}$$

**Where:**

$\beta_{a1}$  = asset beta for proxy company 1

$\beta_1$  = beta of proxy company 1

$Tr$  = tax rate of relevant country

$D$  = debt

$E$  = equity

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

Step 2 – Calculate weighted average asset beta of proxy companies

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

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

**Where:**

$\beta_{aE}$  = 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 ( $\beta$ ) 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<sub>L</sub>** = beta for the licensee

**WA β** = the weighted average β of the proxy firms asset betas from Step 2. The Energy Regulator may adjust this factor to take account of a difference in country risk ratings between the host country of the proxy firms and South Africa.

**t** = tax rate of the licensee

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

**Eq** = the equity of the licensee

**Cost of debt**

The actual cost of debt (interest charges) incurred by the licensee must be used for K<sub>d</sub> and for the calculation of the WACC (both real or nominal as appropriate), subject to the Energy Regulator finding it reasonable through the application of reasonableness tests.

The cost of debt is calculated as:

$$\underline{K_d = K_{d_{pre-tax}} * (1 - t)}$$

**Where:**

K<sub>d</sub> = is the post-tax rate of return on debt capital

K<sub>d<sub>pre-tax</sub></sub> = is the pre-tax rate of return on debt capital

t = is the corporate tax rate

Where actual interest rates are not known (for example where the interest rate fluctuates), the lender's estimate of interest rates for the forthcoming tariff period must be used.<sup>10</sup> At the end of the tariff period, the actual interest rates achieved must be compared with the estimated interest rates used in the tariff application and any adjustment necessary must be made in the Allowable Revenue in the subsequent year of the tariff period (i.e. the clawback/giveback adjustment to be calculated using the audited financials and regulatory reports).

Where the licensee has business activities that are not regulated by the Energy Regulator and the licensee raises corporate debt, the actual cost of debt

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<sup>10</sup> Tariff applicants must provide the estimates made by their lenders in writing.

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 the Cost Allocation Manual.

The cost of debt is based on the pre-tax rate of return on debt capital. Pre-tax cost of debt is rated before deducting the South African corporate tax.

### **Gearing**

When calculating the cost of capital, regulators make assumptions on the gearing level of the regulated companies. Typically, an assumption is made based on an 'optimal' level of gearing that an efficient company would be expected or deemed to have, rather than on the actual level of gearing of the licensee.

The Energy Regulator will use actual gearing ratios as submitted by the applicant, subject to motivation of its reasonableness. Infrastructure finance experience suggests however that at least 30% debt is a reasonable minimum gearing. NERSA will continue using the 30% minimum gearing requirement to ensure optimal gearing levels of regulated entities.

### **Premia included in the WACC formula**

A number of different premia could be included in the WACC formula to adjust the return to account for additional risks over and above that already factored into the Beta and MRP. The Energy Regulator will only consider allowing premia to be included in the WACC if the costs associated with the additional risk are not catered for elsewhere in the Allowable Revenue formula. The following principles will be applied by NERSA in determining whether to allow a premium to be added to the WACC:

- A small stock premium is an adjustment to the CAPM to account for the other risks associated with small companies that the model does not address. Some of the risks that have been cited in the literature include the often-concentrated ownership of small companies, which may imply that investors are not well-diversified; asymmetries of information between small companies and potential investors results in these companies being more difficult to value and hence may be perceived as riskier; small companies may not have access to significant resources to endure external economic shocks and shares issued by small companies tend to be more illiquid than shares issued by large companies (due to higher

transaction costs). Generally, regulators that have awarded a premium have done so due to the relative illiquidity of capital in small companies compared to large ones. As these measures are largely subjective, NERSA's approach for awarding a small stock premium will be based on the size of the licensee as explained below:

- This premium is allowed for all companies that fall into the size bands for which small stock premiums are allowed by practitioners as noted in the latest available PwC Valuation Methodology Survey.<sup>11</sup> The size of the company should be based on the total value of the assets for the regulated activity of the licensee (covering all countries in which the regulated entity has assets relating to the regulated activity). For trading companies the Energy Regulator may consider the level of turnover as a benchmark for size. The awarded premium should be the average used by practitioners surveyed in the PwC survey for the particular company size band applicable to a particular licensee. The small stock premium should be added to the cost of equity component of the post-tax WACC calculated based on the approach outlined above.
- A liquidity or marketability adjustment is generally applied to an equity valuation in which a firm's value is discounted to reflect a risk associated with illiquidity of the firm's assets. The Energy Regulator will not permit a liquidity premium to be added to the cost of equity portion of the WACC for any licensee whether a small stock premium is applicable or not. Given the relationship between a liquidity risk premium and the small stock premium, awarding both a small stock premium and liquidity premium would result in double counting in correcting for illiquidity.

### **Adjusting the WACC for assets located in another country**

Where a portion of the Regulatory Asset Base is located in another country and where that country has a country risk rating that is different from South Africa's country risk rating, then the WACC may be adjusted to take into account the difference between these two countries' risk ratings if the costs associated with that risk are not catered for elsewhere in the Allowable Revenue formula. The adjusted WACC will apply to that portion of the Regulatory Asset exposed to that risk. The WACC may be adjusted by adding the Country Risk Premia to the Cost of Equity to account for this additional risk.

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<sup>11</sup> As at the date of publication of this document, the latest available survey is for 2016/2017.

## 4.8 Financial Indicators

Financial indicators used in a tariff methodology may include *inter alia* the interest cover ratio and the internal rate of return (discount/hurdle rate).

### Interest cover ratio

The interest cover ratio is estimated by dividing the earnings before interest and taxes by the interest expense. i.e.

$$\text{Interest Cover Ratio} = \text{EBIT/Interest Expense}$$

EBIT stands for Earnings Before Interest and Tax and the Interest Expense is the total cost of borrowing in a given tariff period as determined by applying the annual percentage rate on the qualifying debt.

### Internal rate of return

Internal rate of return (IRR) is a rate of return (discount rate) on an investment (project) that will give a net present value of zero. The IRR for a project will be selected at a value that meets a set target cost of capital (known as the hurdle rate). The hurdle rate is therefore an investor's set minimum acceptable required rate of return for making an investment.

## 4.9 Correction Factor or Clawback/Giveback

Under incentive regulation, the following applies:

- **K=** correction factor. This is a factor to adjust for variations between estimated and actual values of variables, such as the demand forecast.

Under Hybrid regulation the following applies:

- Pre-determined **earnings-sharing formula**. The licensee can propose an appropriate earnings-sharing formula to the Energy Regulator. For example, using a rate of return formula with an explicit earnings sharing requirement via which any additional earnings are divided between the licensee and customers.

Under Profit sharing/Sliding Scale the following applies:

- **Cost of capital trigger mechanism.** This is a mechanism by which allowable revenues or tariffs are adjusted to account for changes in the cost of capital. There will be some type of revenue or earnings sharing component, whereby customers and the licensee share the excess of actual revenues over allowable revenues.

Under Discounted Cash Flow the following applies:

- **Financial indicators triggers.** This involves a mechanism by which allowable revenues or tariffs are adjusted to account for the variance from a target range of the hurdle rate or specific financial indicator.

### **Clawback/Giveback principles**

The main purpose of applying a clawback/giveback adjustment is to ensure that the licensees do not gain or lose out from differences emanating from the forecasts and assumptions used at the time of submitting the tariff application and the actual values achieved as contained in and proven by the audited financial statements and regulatory reports. When an over-recovery has occurred due to estimation errors, a commensurate downward adjustment will be made to the allowable revenue of the first tariff period following the submission of audited financial statements (a 'clawback/giveback'); when an under-recovery has occurred, a commensurate upward adjustment will be made to the first year's allowable revenue subsequent to the submission of audited financials.

Any differences between the reason for decision (RfD) values and actual values must be recorded in the regulatory deferral accounts as provided for in the Regulatory Reporting Manual.

Only the audited financial statements and regulatory reports shall be used to determine clawback or giveback calculations.

The following principles will be applied by NERSA in determining the clawback/giveback required. These principles are applicable to all methodologies, where appropriate:

- For all tariff applications, whether for single- or multi-year tariffs, the over/under recovery shall be given/clawed back in the financial year directly following the submission of the audited financial reports (in

practical terms, this is a one-year lag, as the clawback/giveback from year 1 will be applied to the allowable revenues of year 3).

- In order to compensate for the time value of money, the clawback/giveback will be corrected for inflation. In practical terms, the under- or over-recovery from year 1 will be adjusted for the estimated CPI of year 2, and added to the allowable revenue of year 3. For example, if the under-recovery is 100 in year 1, and inflation is determined to be 5% in year 2, the allowable revenue of year 3 will be increased by 105. Note that this will be applied in the same fashion for over-recoveries. In order to encourage accurate estimates, the inflation adjustment is calculated over one tariff period only, and not further inflated for inflation that occurs in year 3.
- The clawback/giveback will be implemented in full in the subsequent year of the tariff period, unless extraordinary circumstances, such as an exogenous economic shock or force majeure events occur, in which case the Energy Regulator may decide to spread the tariff adjustment over several years.
- Non-submission of the audited financial reports within six months of the finalisation thereof will result in a forfeit of an upwards tariff adjustment, where warranted.
- For multi-year tariff applications, the actual data will replace the assumed variables.
- Should the Energy Regulator apply a multi-year clawback/giveback spread, this will be corrected for inflation. The text above applies *mutatis mutandis* for multi-year clawbacks/givebacks.
- A clawback/giveback will only be permitted on the following assumptions:
  - Volumes: Variances between the forecast and actual sales volumes shall be assessed and analysed to determine the cause of the variance. The Energy Regulator will use the audited regulatory financial reports as the source for the actual volumes.
  - Regulated Asset Base: The Energy Regulator will use the audited financial statements and regulatory financial reports to assess the capital expenditure variances. The Energy Regulator will further assess whether the capital expenditure was prudently incurred.
  - Operating & Maintenance Expenses: Any differences in the operating and maintenance expenses emanating between the assumptions used at the time of submitting the tariff application and the actual values contained in the audited financial statements and regulatory reports will be included as part of the clawback/giveback. Only efficient and prudently incurred costs will be included in the

clawback/giveback. The Energy Regulator will be guided in its assessment of whether costs were prudently incurred by the principles outlined in the section of these guidelines relating to operating and maintenance expenses.<sup>12</sup>

- Return on Capital: The return on capital is made up of a return on debt and a return on equity. The latter is based on the WACC and CAPM. The Energy Regulator will permit a clawback/giveback based on the difference in the cost of debt, which will be based on the values contained in the audited financial statements and regulatory reports. A clawback/giveback on the return on equity will not be permitted as the return on equity is based on historical values, not predicted values.
- Calculation errors: The Energy Regulator will not permit a clawback/giveback on calculation errors regarding the cost of equity made by the licensee in its tariff application.
- The actual adjustment (whether clawback or giveback) will be determined by the Energy Regulator, taking the net result of all relevant variable adjustments into account.
- In order to provide regulatory certainty and predictability, NERSA will apply a rules-based system, utilising its discretion where appropriate and based on reasons, facts and evidence, to determine each case on its merits.

#### **4.10 Cost of Service for initial P<sub>0</sub>/R<sub>0</sub>**

The components of Cost of Service for the initial price and revenue (P<sub>0</sub>/R<sub>0</sub>) are the same as those listed under the rate of return methodology as defined in Section 3.2 above.

#### **4.11 The determination of tariffs for liquefied natural gas terminals and related facilities**

Currently, NERSA's mandate does not extend to the 'monitoring and approval' of regasification tariffs. In order to provide certainty and predictability to potential investors in Liquefied Natural Gas (LNG) terminals and related facilities and support the South African Government's proposed Gas-to-Power programme, NERSA provides the following guidance on the methodology for a licensee to determine reasonable and equitable tariffs for LNG terminals and related facilities. Applicants for the construction or operation of regasification facilities

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<sup>12</sup> In determining whether the expense was prudently incurred, the Energy Regulator will be guided by the definition and principles discussed in the section on operating and maintenance costs.

will be expected to provide their financial model in the context of the requirements to demonstrate the viability of the proposed facility, which should contain the projected regasification tariffs.

NERSA's approach will be guided by the following principles:

- licensees should be able to recover all efficient and prudently incurred investment and operational costs, and make a profit commensurate with risk; and
- tariffs for services should be cost reflective and non-discriminatory, except for objectively justifiable and identifiable differences.

Licensees can use any of the five approved tariff methodology approaches outlined in the guidelines to calculate the tariffs for the LNG terminals and related facilities. The guidance regarding the calculation of the components of allowable revenue can also be used by licensees to determine tariffs for LNG facilities and services. The formula to be used for calculating the allowable revenue for the LNG activities is:

$$AR = (RAB \times WACC) + E + T + D \pm C$$

The elements will have the same definitions as defined above.

#### **4.12 The determination of tariffs for distribution**

Currently, NERSA's mandate does not extend to the 'monitoring and approval' of distribution tariffs. In order to provide certainty and predictability to the gas industry and in anticipation of amendment to be made to the Gas Act when providing the necessary mandate, NERSA provides the following guidance on the methodology to determine tariffs for distribution.

NERSA's approach will be guided by the following principles:

- licensees should be able to recover all efficient and prudently incurred investment and operational costs, and make a profit commensurate with risk; and
- tariffs for services should be cost reflective and non-discriminatory, except for objectively justifiable and identifiable differences.

Licensees can use any of the five approved tariff methodology approaches outlined in the guidelines to calculate the tariffs for the distribution. The guidance regarding the calculation of the components of allowable revenue can

also be used by licensees to determine distribution tariffs. The formula to be used for calculating the allowable revenue for distribution is:

$$AR = (RAB \times WACC) + E + T + D \pm C$$

The elements will have the same definitions as defined above.

#### **4.13 The determination of tariffs for Compressed Natural Gas**

Currently, NERSA regulates the storage and transportation of Compressed Natural Gas as 'mobile' storage. The Gas Act clearly states that Compressed Natural Gas falls under the definition of 'gas' and, as long as the process involves a gas pipeline in the value chain, it is considered 'piped-gas' and therefore its tariffs and maximum prices are regulated by NERSA. It is noted that Compressed Natural Gas that originates from a landfill or other facility that does not involve a pipeline is currently not considered piped-gas.

For compressed natural gas facilities licensed as mobile storage, NERSA's approach to the assessment of tariffs will be guided by the following principles:

- licensees should be able to recover all efficient and prudently incurred investment and operational costs, and make a profit commensurate with risk; and
- tariffs and trading margins for services should be cost reflective and non-discriminatory except for objectively justifiable and identifiable differences.

Licensees can use any of the five approved tariff methodology approaches outlined in the guidelines to calculate the tariffs for Compressed Natural Gas facilities. The guidance regarding the calculation of the components of allowable revenue can also be used by licensees to determine tariffs for compressed natural gas facilities and services. Alternatively, the assets and costs of the Compressed Natural Gas facilities can be included in the trading margin as assets and operational costs, this approach will be allowed on application and on a case by case basis.

The formula to be used for calculating the allowable revenue for the activities is:

$$AR = (RAB \times WACC) + E + T + D \pm C$$

The elements will have the same definitions as defined above.



## **5 Assessment of Tariffs**

### **5.1 Introduction**

In this section, the process that will be followed by NERSA to monitor and approve proposed tariffs is described.

### **5.2 Approach of testing tariff proposals**

NERSA may choose to use any reasonable comparator to the tariff applied for by the applicant. In principle, the methodology used by the licensee will be used to ensure a comparison of like with like and to achieve consistent and objective decision-making. In addition, NERSA may use additional information; alternative methodologies; or rely on expert views.

Further, the Energy Regulator intends to specify the preferred sources of information that may be used for tariff calculation input variables. The published sources of information will include the following:

- Historical equity/stock returns for determining Market Risk Premium;
- Historical RSA government bonds returns;
- Risk-free rate ( $R_f$ ) expectations;
- Tax rate;
- Beta benchmarks of proxy companies including adjustments thereof;
- Historical Consumer Price Index and Producer Price Index data; and
- Consumer Price Index and Producer Price Index expectations.

The intended publishing of sources of data is aimed at addressing the need for clearly defined input factors and stakeholders' requests that each input element be reviewed and approved on a regular basis.

In addition, an applicant retains the option to use data from a source different from the list of preferred sources for input variables, in other words, the preferred sources are not an exclusive and exhaustive list. However, before using such data, it must be approved by the Energy Regulator after the due process is followed.

Moreover, an applicant or licensee may submit an application for an amendment of these guidelines should a strong preference for an alternative methodology occur. In the event of such application, the Energy Regulator will consider the request to include an additional methodology after the due process is followed.

The above implies that the Energy Regulator will request licensees to submit tariff applications based on their preferred methodologies using the Energy Regulator's published preferred sources of information. The Energy Regulator will perform the comparison test on each tariff application and may request a licensee to provide evidence of the calculation of specific elements in the tariff application.

Any deviation from the tariff calculated by the Energy Regulator will be dealt with on a case-by-case basis. The Energy Regulator is not able to set a 'maximum deviation allowed' as requested by stakeholders as this would constitute prejudging of individual cases and would encourage speculative applications.

The following objectives will be followed in testing tariff proposals:

- promote the efficient, effective, sustainable and orderly development and operation of gas transmission and storage facilities;
- promote the provision of efficient, effective and sustainable transmission and storage services;
- facilitate investment in gas transmission and storage;
- ensure the safe, efficient, economic and environmentally responsible transmission and storage of gas;
- ensure that gas transmission and storage services are provided on an equitable basis and that the interests and needs of all parties concerned are taken into consideration;
- promote the development of competitive markets for gas and gas services;
- facilitate gas trade between the Republic and other countries; and
- promote access to gas in an affordable and safe manner.

In practice, this requires a delicate balance to be struck between facilitating investment and the requirement that 'the interests and needs of all parties concerned are taken into consideration'. The desired outcome should be one that results in tariffs that are sufficiently high to promote access to gas in an affordable manner as well as to promote investment while not preventing the development of gas markets.

### **5.3 Regulatory financial reporting and data requirements for regulation**

To effectively monitor and approve tariffs on individual pipelines and storage activities or facilities will require licensees to develop financial and operating data for both the business plan (prospective) and regulatory returns

(retrospective submissions) for each gas transmission and storage facility. This approach is described as accounting separation for regulatory reporting purposes and will be a key requirement for implementing a monitoring methodology for gas transmission and storage.

For this purpose, NERSA has developed the Regulatory Reporting Manuals. The Manuals prescribe the format in which financial data, facilitated by a cost allocation manual, must be submitted to the Energy Regulator. Key aspects of appropriate accounting separations are:

- that only the costs related to the specific activity are attributed to that activity; and
- that vertically integrated businesses must be managed separately with separate accounts and data, with no cross-subsidisation between activities/facilities.

The regulatory reporting data and projections are required by NERSA for tariff monitoring purposes regardless of which tariff methodology or which tariff structure is adopted by licensees.

#### **5.4 Indexation of the tariffs**

Tariffs must be adjusted or indexed on an annual basis only, unless there are compelling circumstances that must be approved by the Energy Regulator.

## **6 Common Approaches to Tariff Structuring**

### **6.1 Introduction**

This section of the tariff methodology is not intended to be prescriptive, but aims to provide an overview of typical approaches to tariff structuring. Licensees are able to choose the tariff structure most appropriate to their particular circumstances, within the confines of the tariff principles outlined in section 2.

Below are the common approaches to tariff structuring. In particular, these concentrate on the geographic dimension of the tariff structure, namely:

- full-distance pricing;
- entry/exit pricing; and
- postal pricing.

### **6.2 Geographic dimension of tariff structure**

#### **6.2.1 *Full-distance pricing***

Full-distance-related pricing is the calculation of tariffs (for both capacity and volume) for individual pairs of entry and off-take points. The tariffs will reflect the distance between the off-take point and the point where gas was delivered into the pipeline system (the entry point). It will be necessary to calculate a tariff for each entry and off-take point, based on the distance between the off-take point and each entry point.

Where the configuration of the pipeline system is complex (i.e. there are many interconnections) and there is a large number of off-take points, full distance pricing may be complicated to develop and impracticable to administer and maintain.

#### **6.2.2 *Entry/exit pricing***

Entry/exit pricing is a simplified approximation of full-distance pricing. Off-take points are grouped according to their location – the Exit Zone. Tariffs (both capacity and volume) are set for each Exit Zone. The tariff for the off-take point is then determined according to the Exit Zone in which it is located.

In addition, tariffs will be set for the transmission of gas from the point at which it is delivered into the system – the Entry Point – to the Exit Point. The Entry Point may be an import terminal, processing or storage facility or regasification plant.

The high-pressure system may be divided into regions, with staging posts along its length. The customer will be charged the tariff applicable for each leg of the pipeline system through which gas is transported. A variant of this tariff structure is the use of a nodal system, where congestion at certain points in the system can be priced accordingly.

### **6.2.3 Postal pricing**

Postal pricing is a system in which each off-take point in a particular region is charged a flat rate, irrespective of its capacity, the distance gas is transported or any other characteristics, similar to a postage stamp system.

Postal pricing has the advantage of simplicity, although it may be less suitable for a regulated environment, as it does not fully reflect costs associated with gas transportation over specific distances.

## **6.3 Approach to calculating the level of cost based tariffs**

Gas pipelines can, within certain geographical limits, be considered as natural monopolies. In the absence of competition, the objective of regulation is to ensure that tariffs will be closely related to the costs of providing gas storage or transmission services. The first step, therefore, in approving tariffs, is to define the costs that are to be recovered through tariffs.

The approach preferred by the Energy Regulator for calculating the level of cost-based tariffs is the average accounting cost (also known as fully allocated cost) approach. The fully allocated cost approach is prescribed in the Regulatory Reporting Manuals.

### **6.3.1 Average accounting cost (or Fully Distributed Cost)**

*Definition*

The average accounting cost (AAC) method is based on the allocation of total costs of operating the system to different storage or transmission services and then expressing these as an average unit cost. This approach is also known as ‘fully distributed cost’.

For each service, the allocated costs may be further segregated according to the cost drivers. The cost drivers will include fixed and distance-related elements:

- distance (or geographic zone);
- seasonality;
- load factor (i.e. the ratio of average daily demand to peak day demand); and
- volume.

Average tariffs may then be calculated for each service and cost segment.

#### *Issues for developing AAC tariffs*

The development of tariffs on this basis requires a detailed understanding of the costs associated with each service.

Unbundling of accounting information is required to support this approach. The number of services identified depends on the degree of unbundling that is adopted.

It is generally accepted that the higher the number of services to which costs are allocated (and hence the higher the degree of unbundling) the more correct the economic signals given by the tariffs.

Section 21(1)(c) of the Gas Act provides that the gas transmission, storage, distribution, trading, liquefaction and re-gasification, activities of vertically integrated companies must be managed separately with separate accounts and data and with no cross-subsidisation. Hence