



**Issues for Consideration in the
Review of the Port Tariff Methodology**

Discussion Document

2016/17

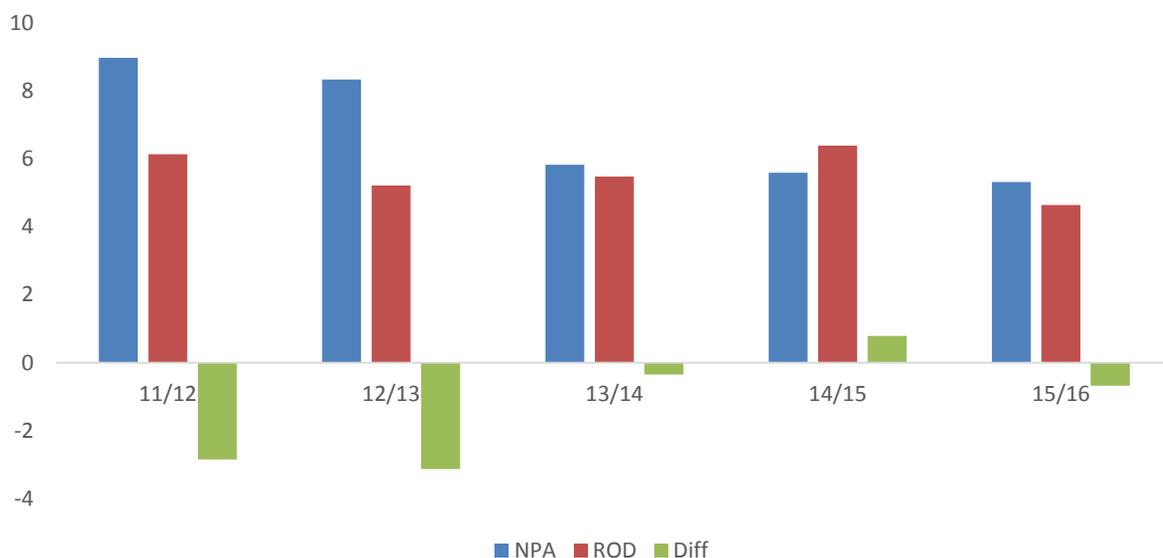
Disclaimer

The sole purpose of this document is for providing a guideline for comments and proposals on the Review of the Multi-Year Tariff Methodology. In no way must the document (and its contents) be construed to reflect the view of the Regulator or any of its Members. Whilst it aims to highlight some of the practical constraints faced in the regulation of port tariffs, it does not preclude any proposals, alternatives, suggestions, or comments that may not be covered in this document.

Introduction

The purpose of this document is to serve as a point of departure or discussion paper as a part of the review of the current tariff methodology, still in effect up to the 2017/18 tariff year. The current tariff methodology (applicable from 2015/16 – 2017/18) has allowed a significant smoothing of the National Ports Authority's (NPA) return. At the same time, the methodology has allowed the Ports Regulator of South Africa (the Regulator) to establish a lower tariff trajectory whilst still ensuring that the NPA remains profitable.

Figure 1: Return on Equity (last 5 years)



The review of the tariff methodology will incorporate a minimum of two rounds of public consultations in order to ensure that sufficient input from stakeholders is received for consideration. As such this document aims to set the context in which the Regulator seeks to engage with stakeholders as well as to provide a platform on which input can be made.

The document discusses salient points of the methodology, including more specific areas in which the Regulator requires comment or proposals as these areas may result in either unintended consequences, may negatively affect the tariff setting process, or should just be expanded on with regards to the current methodology. Annexure "A" widens the discussion and contains a short overview of the different approaches to regulation and tariff setting that both fall within the scope of the review.

A look at the current Tariff Methodology

Introduction

This section outlines the current tariff manual whilst providing context for the review through questions, comments, proposals and options.

Significant strides have been made since the first Regulatory decision in 2009/10 and the determination of a multi-year tariff methodology in 2015/16 was yet another step in the process towards regulatory certainty. Whilst retaining the fundamental elements of previous determinations, the present tariff methodology is a multi-year in its approach, applicable to the 2015/16-2017/18 tariff years, resulting in continued improvement in the level of transparency and consistency in the tariff setting process. This process seeks to continue and strengthen the transparency and effectiveness of the regulatory tariff setting methodology whilst expanding its scope and providing more focus on the embedded incentives inherent to the methodology.

The current approach, whilst fraught with challenges, remains arguably the best fit for the developmental stage of the South African port regulatory system and as such a brief discussion on the elements that make up the current methodology with some questions and proposals for users to consider in the context of making a submission on the methodology review is set out below.

Background: The Regulator's Mandate

The Regulator's approval is required for the tariffs charged for services and facilities offered by the NPA in accordance with the National Ports Act, 12 of 2005 (the Act).

In terms of the Act and the Directives of 2009 promulgated in terms of section 30(3) of the Act as amended in 2010, the NPA must submit an application on the tariffs it proposes to charge for services and facilities that it offers, to the Regulator for approval. The Act, its Regulations and the Directives constitute the South African ports' economic regulatory framework. The South African ports economic regulatory framework, amongst others things, makes provision for a transparent tariff setting process with port users' consultations being a key requirement.

On an annual basis, the NPA submits a tariff application to the Regulator who in turn will consider the application in conjunction with all subsequent submissions, written and oral comments received in the consultation process, including the responses thereto, and its own information and research.

In this regard it should be noted that the Ports Regulator has promulgated Directives in terms of section 30(3) of the National Ports Act (Government Notice 825, Gazette No. 32480, 6 August 2009). These were amended in the Directives Amendment Notice, promulgated in Government Notice 37, Gazette No. 32898, 29 January 2010.

Further, the Regulator has formulated a long term Tariff Strategy which is based on a ‘ use and benefit’ approach to cost allocation. The Strategy depends on the Revenue Requirement (RR) approach to allocate costs to specific user groups. Tariffs from 2017/18 onwards will be adjusted in accordance with the consulted and adopted Tariff Strategy.

The multi-year methodology in context

The “multi-year” tariff methodology in the current instance refers to the calculations of tariffs for the period 2015/16 - 2017/18 based on a single methodology.

The multi-year tariff application has different calculations for each tariff year in the tariff period, consisting of forecasts and calculations of each of the components of the RR approach. Annual adjustments to the values of the components will be taken into account through a claw-back (or give-back) mechanism.

The NPA publishes a revised tariff book of all prices reflecting the decisions of the Regulator as set out in the Record of Decision, for the first year of each rolling multi-year period. In addition, the NPA is required to submit as part of the application any proposed changes to the existing tariff book that will reflect increases (or decreases) different from the average tariff increase applied for.

Methodology Period

The Regulator has currently allowed for an annual review and an annual adjustment of tariffs within a three-year period as opposed to fixing the prices for the period as this protects users from possible large step changes in the tariff. In addition, unlike other regulated industries like electricity or oil and gas pipelines there are large variations in the users and usage of port infrastructure and services and an annual review allows adjustments in prices to be more efficiently and appropriately allocated/distributed to users than an adjustment after three years.

- Comments and views on the appropriate length of the methodology period are required especially with a view of formulating a longer view of a tariff trajectory based on port capacity expansion, estimated volume growth etc.

Current Tariff Methodology: Elements Overview

The Required Revenue (RR) approach has been used in the past by the Regulator for determining the tariff amendments in response to the NPA’s annual tariff applications since the inception of the current regulatory regime. The Regulator, for the 2015/16-2017/18 financial years, continues with this approach. The formula for the RR methodology is as follows:

Revenue Requirement

$$\begin{aligned} &= \text{Regulatory Asset Base (RAB)} \\ &\times \text{Weighted Average Cost of Capital (WACC)} + \text{Operating Costs} \\ &+ \text{Depreciation} + \text{Taxation Expense} \pm \text{Clawback} \\ &\pm \text{Excessive Tariff Increase Margin Credit (ETIMC)} \end{aligned}$$

The above formula reflects a standard building block approach to setting the revenue requirement of a regulated service provider and has been used in a similar way in all previous tariff determinations. This approach accords with rate-of-return revenue requirement calculations by Regulators in South Africa and internationally (as modified in the ports regulatory practice over time) and has been used as the basis for assessments by the Regulator in the preceding applications.

The methodology requires that the NPA estimate its operating costs, depreciation, tax expense and return on capital (a product of the weighted average cost of capital and the value of assets in the Regulatory Asset Base (RAB) for the period under review).

In addition, the methodology provides for a claw-back mechanism that corrects for over or under recoveries in previous tariff periods, as well as the excessive tariff increase margin credit (ETIMC). The ETIMC mechanism allows for large increases in required revenue and/or tariffs that may arise from volume volatility or substantial capital expenditure programmes in future years to be partly offset by moderately higher tariff increases in the short-term.

The standard exposition of the Revenue Requirement approach is:

$$RR = (v - d + w) r + D + E + T \pm C \pm ETIMC$$

Where:

RR	=	Revenue Requirement
v	=	Value of the assets used in the regulated services
d	=	Accumulated depreciation on such assets
w	=	Working capital
r	=	Regulated return on capital
D	=	Depreciation accounted for in the period of the tariff
E	=	Operating costs
T	=	Taxation expense
C	=	Claw-back
ETIMC	=	Excessive Tariff Increase Margin Credit
(v - d + w)	=	Regulated Asset Base

Regulatory Asset Base (RAB)

The RAB represents the value of assets that the NPA is allowed to earn a return on. As the return earned on these assets is expressed in real terms, the value of total assets in the RAB is indexed to inflation each year - the Trended Original Cost (“TOC”) approach. Each year, estimated capital expenditure and depreciation is added to the closing balance for the previous year to arrive at an updated closing balance for the current year. The expected working capital balance is added to arrive at a total RAB estimate, which is averaged over the year to account for the progressive spending of capital works in progress (CWIP) over the period.

Calculation of the RAB

In the previous tariff determinations, the Regulator accepted the Depreciated Optimised Replacement Cost (DORC) method used by the applicant in certain assets to determine a starting RAB. The Regulator did however state, that although it had a low level of confidence in the RAB determined through the 2008 DORC method, which gave rise to a steep increase in the asset values, but regulatory certainty was required in the absence of any alternative. The Regulator retains these concerns and has commenced a process to assess the application and appropriateness of these valuations for major assets to inform subsequent assessments of RAB. This process is currently underway and is expected to inform the review of the methodology.

However, the Regulator has previously determined that the 2010/11 Record of Decision (ROD) value establishes the starting point for trending the RAB in future tariff determinations. Nonetheless, the Regulator has applied a number of adjustments to arrive at an opening balance for the 2013/14 financial year and a subsequent calculated and updated closing balance of R 62 888 million for the 2013/14 financial year.

The RAB value for the period under review is determined using the following formulas:

$$RAB_y = \frac{1}{2} [RAB_{c,y} + RAB_{o,y}] + w_y$$

$$RAB_{c,y} = RAB_{o,y}(1 + CPI_y) + CWIP_y \cdot (1 + CPI_y) - D_y$$

Where:

RAB_y	=	value of the RAB used to determine the returns for the period y
$RAB_{o,y}$	=	opening value of RAB for the period y
$RAB_{c,y}$	=	closing value of RAB for the period y
w_y	=	forecast average net working capital over period y
$CWIP_y$	=	value of expected capital investment over the period y
D_y	=	depreciation allowance for assets over the review period y
CPI_y	=	annual rate of general inflation expected over the period y

- Comments on the appropriate approach to the calculation and treatment of the RAB are required.

Depreciation

In order to satisfy the principle of financial capital maintenance to fully take into account capital expenditure and inflation, the following formula is used in the calculation of depreciation:

$$Depreciation = (RAB_{(o,y)} + (RAB_{(o,y)} \cdot CPI_{(y)}) + (Capex_{(y)} / 2 \cdot CPI_{(y)})) / 40$$

- Comments on the appropriate depreciation methodology and period for inclusion in the RAB are required, taking into account that the scope of the current valuation project of the regulator will formulate a view on the appropriate depreciation periods, treatment of depreciated assets etc.

Inflation Trending

The inflation rate for calculating the trend in the value of assets will be the Consumer Price Index (CPI) forecast for each financial year during the tariff period as at the latest forecast published by the National Treasury, which if unavailable by the time of calculation are substituted with the latest reputable forecasts from leading independent institutions such as the Bureau of Economic Research (BER). The same inflation rate is used in the calculation of the weighted average cost of capital.

This has previously resulted in delays in the release of the tariff decision as the National Treasury release dates are fixed.

- Comments on the appropriate price level or trending variable for inclusion in the tariff methodology are required.

Capital Works in Progress (CWIP)

Detailed projections for the tariff period, per asset class, service and project as well as monthly planned expenditure schedules are currently provided to motivate the CWIP to be included in the RAB. All capital expenditure approved and not fully implemented are taken into account as part of the claw-back process and the RAB and its return adjusted accordingly. The Regulator has in the past relied on the Port Consultative Committees to “in principle” approve or support the capex requirements. Input and proposals regarding the appropriateness and effectiveness of this process are required.

- Comments on the appropriateness and format of capex requirements including the consultation processes (e.g. PCC processes) for inclusion in the tariff methodology are required.

Working Capital

The regulatory purpose of the RR approach is to determine the revenue required by the NPA to recover its costs and an appropriate return. This must include the concept of the time value of money as in many (most) cases the time at which a particular cost is incurred is not matched with the associated tariff. As such, capital is required to cover the time delay. This however, has a cost associated with the additional capital requirement. In order to correct for the inherent assumption in the revenue requirement approach that expenses and revenues occur at the same point in time, an allowance for the time difference is included.

The estimate of working capital included to adjust for the cash requirements related to capital expenditure requirements, equates to the actual *net* working capital as per the latest available NPA annual financial statements (not the change in working capital), consisting of accounts receivable plus inventory less accounts payable (i.e. operating cash is excluded), adjusted by forecast volume growth and CPI inflation for the following year. In addition, CWIP *payables*, which are estimated at 1/12th of the capital expenditure projected for that year is included. Volume and CPI forecasts used in the calculation of outer years' working capital will be updated as and when these numbers become available as part of the claw-back mechanism.

- Comments on the appropriateness inclusion and calculation of working capital in the RAB calculation in the tariff methodology are required.

Weighted Average Cost of Capital (WACC) - Vanilla WACC

In general, the WACC represents the risk adjusted opportunity costs of capital and is the minimum return for an investment in order to continue to attract capital, given the risks.

A real WACC (the cost of equity and the cost of debt) will be applied and expressed in Vanilla terms (i.e. post-tax cost of equity and pre-tax cost of debt). Accordingly, a separate allowance for tax expense in the revenue requirement formula is required (The use of a vanilla WACC in part manages the inherent incentive for the NPA to raise its gearing levels above 50% to increase the benefit of the interest tax shield and therefore reduce its tax bill relative to that allowed by the Regulator-a significant consideration by the Regulator given the non-corporatisation of the NPA).

$$WACC_{vanilla} = k_d \cdot g + k_e(1 - g)$$

Where:

$$\begin{aligned} k_d &= \text{pre-tax cost of debt} \\ k_e &= \text{post tax cost of equity} \\ g &= \text{gearing, which is debt over total capital} \end{aligned}$$

- Comments on the appropriateness and calculation of the “vanilla” WACC in the Revenue Requirement methodology are required.

Cost of Equity (k_e)

The post-tax cost of equity is calculated with reference to the capital asset pricing model (CAPM), which is expressed as:

$$k_e = r_f + \beta \times MRP$$

Where:

r_f = Real risk free rate

B = Measure of NPA's exposure to market (non-diversifiable) risk

MRP = The market risk premium measuring the premium over and above the risk free rate that investors might expect to earn

- Comments on the appropriateness of the general use of the CAPM in the calculation of the cost of equity in the tariff methodology are required.

Risk Free Rate (r_f)

The current methodology uses the twenty-year government bond as an appropriate measure of the RFR, and, in particular, the R186 bond instrument (yield) as it is seen to adequately reflect the market's perception of sovereign risk and inflation going forward. The average RFR is calculated over a five-year period.

The use of a risk free rate instrument is to provide a proxy for the opportunity cost of investing equity in the regulated entity. A number of questions arise, including whether the appropriate variable should be a South African based variable (or some other internationally accepted "risk-free" rate), should it be South African Rand denominated and what should the appropriate period be (average of the previous five or ten years (or linked to the depreciation periods?) Or should the RFR reflect some future yield.

The *Real* RFR is deduced by using the Fisher Equation.

$$1 + i = (1 + r)(1 + E(I))$$

Where:

i = Nominal rate

r = Real rate

$E(I)$ = Expected inflation

- Comments on the appropriateness of the current variable used as a proxy for the RFR, including the appropriate calculation (average periods etc.) of the input into the CAPM are required.

Market Risk Premium (MRP)

The MRP is in essence forward-looking and, as such, it cannot be observed but must be forecast. Currently the Regulator uses the latest available Dimson, Marsh and Staunton (DMS) estimate of the geometric mean MRP as measured against bonds for South Africa to determine an MRP for the NPA cost of equity calculation. The use of the DMS dataset over the full 113-year period requires the use of the geometric mean.

- **Comments on the appropriateness of the current variable used as a proxy for the MRP, including the appropriate calculation of the mean and the period thereof for input into to the CAPM are required.**

Beta (β)

Because the NPA is not a traded company, there is no beta (β) published reflecting its risk relative to firms listed on the Johannesburg Stock Exchange (JSE). A beta has to be set to reflect the risks faced by the NPA under the RR methodology. This must ensure an appropriate return for the risk faced.

The inclusion of a claw-back mechanism reduces exposure to systematic risk and the existence of an interventionist regulatory regime requires the Regulator to use a Beta substantially lower than large firms listed on the JSE such as the JSE top 40.

Currently, the Regulator uses the 0.50 asset beta as decided upon and motivated in the previous Records of Decision.

The Hamada equation is used to re-lever the beta resulting in an equity beta of 0.86.

- **Comments on the appropriateness of the current use of the asset beta (versus the use of a debt beta etc.) to calculate the equity beta, including the appropriate method for the calculation of the levering/re-levering are required. If a proposal of a different beta is made, please provide the calculations and sample of comparisons (including the criteria for the comparison sample)**

Gearing (g)

The Regulator, taking into consideration previous applications, previous patterns of variation in the applications, various submissions and its own analysis of the NPA's gearing, determined that an appropriate gearing for the entity for the period is 50%.

- **Comments on the appropriateness of the current assumed gearing for use in the WACC are required. It must be noted that the regulatory gearing level does not necessarily reflect the**

actual gearing of the regulated entity, but rather a gearing that is seen as the most efficient from a regulatory perspective.

Cost of Debt (k_d)

NPA's actual, embedded debt costs should be used to determine the cost of debt applied within the WACC. However, the non-corporatised nature of the NPA, the Regulator is forced to use the average embedded *Transnet group* cost of debt (*pre-tax nominal*) (Transnet Ltd) as no current alternative exists. The NPA is required to submit the initial calculation of the variable as well as revised average embedded debt costs based on the average embedded Transnet group cost of debt on a group level, on an annual basis on 1 September every year following the initial application.

- **Comments on the appropriateness of the current approach (including alternative options) used as a proxy for the k_d , including are required.**

Taxation Expense (T)

The Regulator will accept the current corporate tax rate of 28% (t) for the period. The Regulator will use the pass-through tax approach, where the vanilla WACC will be applied to the average RAB for the period under consideration, less the interest cost of debt and wear and tear, and other tax allowances. The corporate tax rate is used to determine the tax liability, which are currently treated as an expense in the RR calculation as follows:

$$\text{Tax allowance} = (\text{Net revenue before tax allowance}) / (1-t) * t$$

“Net revenue before tax allowance” is the revenue after all costs including interest and tax allowances have been accounted for; i.e. it is the net return to equity before being grossed to make allowances for taxation. The intention of the current methodology is to ensure that the calculation of the tax allowance also reflect the flow of funds related to any claw-back calculated as well as ETIMC allowances to ensure adequate tax cover for the NPA. The strict implementation of the current methodology does however introduce significant volatility and simulations has shown that the NPV over the lifecycle of a project is the same whether you use a pass-through tax or a “net-revenue approach”

Any changes in the corporate tax rate are taken into consideration as and when required and the claw-back mechanism adjust the taxation expense as per the Annual Financial Statements (AFS) as these become available.

- **Comments on the appropriateness of the current approach used as a proxy for the taxation allowance, including alternatives and the treatment in the claw back mechanism are required.**

Operating Costs

The Regulator currently analyses the operating cost estimates for the period on a detailed line by line item basis. The NPA is requested to provide detailed and complete motivation for each of the expenses applied for, especially on large items like labour and energy costs.

- **Comments on the current analysis of operational expenditure as well as the key items that the methodology should focus on as submitted by the NPA (keeping in mind that the Regulator does receive detailed confidential submissions related to specific expenditure items, including group costs) are required.**

Currently, the Regulator continues to allow the inclusion of the Transnet group costs in the total allowed expenses subject to the requirement that the NPA submits detailed explanations and motivations for the amount to be transferred to the Transnet group. This are expected on a level of detail that will allow assessment of its necessity, as well as the actual services/goods received, and for which function of the NPA it was utilised. Adjustments are made on an annual basis if and when the Regulator determines any group cost component to be inappropriate based on audited reports.

In addition, the NPA shall provide an externally and independently audited financial report (with all supporting documentation and detailed explanations including basis of allocation and policy documents that support such allocation) on all line items that form part of the group costs that have been expended for the NPA FY each year in the year after the close of the financial year or until an alternative methodology or amendment of this methodology is published.

The Regulator also reserves the right to claw-back all or any portion of the amount in future tariff decisions, should the Regulator not be satisfied that the expenditure is within the scope and mandate of the NPA, and that the amounts are reasonable, or reasonably allocated to the NPA.

- **Specific comments on how the Regulator currently deals or should deal with the group cost component are required.**

Claw-Back

The key purpose of applying claw-backs is to ensure that the NPA or any port user is fairly treated and is not subjected to unfair gains or losses that are the result of incorrect forecasting, inaccurate information and system shocks. This includes reducing and sharing risks faced by all port system participants including the NPA. Its main application is to reduce the impact of differences between allowed Revenue (based on a number of forecasts and assumptions) calculated at the time of the tariff application and actual audited figures, to ensure the coherence and integrity of the regulatory regime. The volatility of trade volumes and

the difficulty in forecasting imports and exports accurately, presents significant problems, especially as pertains to the prediction of volumes in outer years of a multi-year tariff period.

However, the following variables that are estimated in line with the regulatory manual, annually, prior to the start of the following tariff year for claw-back purposes are the:

- RAB (including CAPEX)

The RAB is adjusted annually to reflect actual capex and working capital requirements in line with AFS numbers.

- Depreciation

Depreciation is recalculated based on the adjusted RAB.

- Volumes

Actual volume numbers are used to calculate the claw back.

- Inflation (CPI)

Whilst the return on equity and the return on debt (in other words the WACC) are not changed, the actual inflation rate is used in the recalculation of a number of variables, including the trending of the RAB, working capital forecasts and other latest estimates during the assessment.

The forecast or estimation of these variables are conducted annually and actual data are used in determining the claw-back pertaining to the previous tariff year where the 50% rule applies and the final claw-back determined in the following year when actual numbers are available.

- **Specific comments on how the Regulator implements the claw back mechanism as well as how it should be dealt with (if different) are required.**

Excessive Tariff Increase Margin Credit (ETIMC)

The Regulator regulates in the long term interest of the industry. This requires that the Regulator not only confine itself to the immediate tariff decision, but also considers ways to ease any future shocks to the system. It is generally accepted that capital expenditure may spike at some point in the foreseeable future, but that these projects have not as yet been specified to a level of detail that allows for accurate prediction. In addition, external market related factors such as unexpected (or expected) fluctuations in volumes, inflation, the RFR etc. may also result in significant spikes in the tariff. As such, the Regulator in the past considered it prudent to avoid excessive future tariff changes by retaining and increasing the NPA's Excessive Tariff Increase Margin Credit (ETIMC), to allow the smoothing of unaffordable tariff spikes over multiple periods in the future.

Because the ETIMC is revenue collected from port users before the NPA is entitled to it, it should yield a return for users to compensate them for the opportunity cost of their capital. The ETIMC will therefore

earn a return which is equal to the WACC allowed by the Regulator. The return on the ETIMC will be factored into the balance and the calculation of the total available under the ETIMC facility will be published annually.

Currently, the Regulator further deems it necessary to define the use of the ETIMC facility in the following way:

“The Regulator may authorise the release of part or the whole of the value of the ETIMC facility to influence tariff levels whenever it deems necessary including, but not limited to spikes in tariffs (defined as an average tariff increase in excess of the inflation forecast) due to a sharp increase in capital expenditure, volume volatility, or any market related factor. The Regulator may also consider national objectives in any decision to add to, or to utilise the ETIMC facility to adjust tariffs. “

- **Specific comments on how or when the Regulator should deal with the ETIMC are required. Specific proposals around the criteria or hurdle rates for regulatory use of the ETIMC mechanism would be helpful.**

Volume forecast

The NPA is required to submit detailed volume forecasts with reasons as well as revenue calculations based on the forecast volumes and current tariff levels as well as proposed tariffs for the period.

Introduction of efficiency incentive

The current incentives build in to the RR methodology does not favour increased efficiency or competitiveness as the claw back mechanism takes away the gains from higher efficiency with additional market volume effects. This must be addressed in an integrated way through the inclusion of an efficiency measure within the RR methodology. Whilst some positive effects will filter through with the introduction of efficient pricing through the Tariff Strategy, that will only impact over the long term. More urgently, an approach must be defined to identify and differentiate between volume gains (or volume losses) due to efficiency impacts and market effects. In addition, financial efficiency, especially related to the efficient planning and spending of CAPEX and operational expenditure must be considered.

The introduction and continued evolution of the Terminal Operator Performance Standards (TOPS) as well as the Marine Operators Performance Standards, is in this instance of high interest to the Regulator as the measurement and monitoring role that the system will produce may be used as an input into the tariff system to establish more transparent and concrete incentive targets with benefits to the port owner as well as port users.

The Regulator will continue to monitor progress in this regard and will introduce an operational efficiency component to the tariff determination when the Regulator is satisfied that a credible efficiency monitoring system has been established or a credible, robust alternative has been defined.

- **Specific comments or proposals on how the Regulator may introduce operational efficiency incentives in the methodology are required.**

Written submissions should be addressed to:

The Chairman, Ports Regulator, Private Bag X54322, Durban, 4000 /

11th Floor, The Marine Building, 22 Dorothy Nyembe Street, Durban, 4001

Contact person: Mr. Phakade Sicwebu

Tel.: (031) 365 7800, E-mail: tariffcomments@portsregulator.org or Fax: 031 365 7858.

All persons are invited to submit written comments by Friday, 30 September 2016.

Copies of the current Tariff Methodology may be found on the Regulator's website at http://www.portsregulator.org/images/documents/Regulatory-Manual-for-the-Tariff-Years-2015_16-2017_18.pdf.

Annexure A: Regulatory Options: An Overview

In order to further stimulate the discussion on the broader regulatory approach as well as to enable a more constructive engagement with the current methodology, an arm's length overview of the different regulatory approaches and options is provided below.

When considering the options below, take into consideration that the Regulator must take into account the need to ensure that the NPA is able to one, recover its investments, two, cover its costs and thirdly, make a profit commensurate with its risk when deciding on a methodological approach to tariff setting. In addition, the need for capacity development whilst sustaining a stable and affordable tariff trajectory in bringing down the cost of doing business is a critical consideration in this regard. With this in mind, the following methodologies are highlighted.

1. Rate of Return Regulation - Revenue Required (RR) Methodology

The Rate of Return regulation method is often used to determine fair and reasonable prices for all parties. The prices are reasonable because they allow the company an opportunity to recover its costs as well as earn a fair return on capital employed whilst at the same time it protects customers from paying excessive monopolistic prices, with the argument being that monopolistic firms should be required to charge the price that would prevail in a competitive market.

RR is one such method that uses the rate of return. It enables the firm to make a reasonable return on their assets after covering all operating costs, depreciation and taxes.

The various components of the RR formula need to be assessed in order to correctly determine the correct outcome. The return on investment and regulatory asset base are two such components which are generally controversial in the use of this formula due to the various methods of obtaining figures for each. The return on investment could represent Return on Equity (ROE), Return on Capital Employed (ROCE), and Return on Net Assets (RONA) or alternatively the cost of capital as calculated by the Weighted Average Cost of Capital (WACC). All of these rates of return have different measurements and need to be analysed to determine the most appropriate rate of return on investment. The Regulatory Asset Base (RAB) can also be calculated by using various different methods. Maintenance and general upkeep costs are granted.

In practice, tariffs for years ahead are based on forecasts for various considerations. As a general rule, the longer the forecast period is the less accurate the forecasts towards the end of the period are likely to be. In time, forecasts can be replaced with actual data for those variables. When sufficient actual data is available for a tariff year, the tariff will be recalculated. If there is a difference, claw backs or give backs will be calculated. This will be done each year during a multiyear tariff decision as is the

practice currently. Because actual data for year one will only become available in tariff year two, any claw back or giveback will only be implemented in tariff year three.

Actual volumes will replace estimates when claw backs or give backs are calculated. For future years more up to date forecasts may be more accurate and lead to smaller tariff adjustments. Such newer forecasts could be implemented each year at the same time that changes as a result of claw backs or give backs are implemented. In years when there are large volume changes using more recent volume forecasts may reduce the size of the claw back or give back. However annual volume forecasts will make the calculation of claw backs or give backs much more complicated involving multiple claw backs for a particular year, and thus more prone to human error, however, the use of a three-year period, in the current methodology includes a mid-period adjustment, that should, in theory, reduce the volatility over the period as a result of the claw-back.

A number of advantages and disadvantages to the use of a RR methodology are highlighted.

Advantages

1. It ensures financial viability of the regulated entity by reviewing costs of the utility annually and allowing for justified cost increases
2. By ensuring the regulated entity a return on their investments, the Regulator takes away investment risk from an investor which results in a lower required return on capital and therefore lower prices.
3. It ensures and requires a high level of regulatory oversight.
4. Well understood and simple to implement
5. Ensures openness, transparency, and due process
6. Allows for implementation of cost-causation principle.

Disadvantages

1. Required Revenue could encourage over-investment in sometimes non-productive assets resulting in under-utilisation of productive assets or gold plating.
2. As the methodology is based on cost plus method of determining revenues required, it does not give incentives for the regulated entity to reduce costs
3. It provides an incentive for the regulated entity to overstate costs and the asset base, resulting in a higher revenue required
4. It is difficult to determine a “fair” rate of return from the utility’s, user and the Regulator’s perspective.

2. Hybrid Tariff Methodology with Rate of Return & the Cost Plus Approach

The Cost plus approach is generally used within the *Rate of Return* tariff methodology. (For a detailed explanation of *Rate of Return* please refer to the *Rate of Return* tariff methodology earlier). When utilizing this hybrid tariff methodology, the entity's RR is calculated on a cost plus basis. As a result, the entity is allowed to recover and receive its operating costs plus a mark-up equivalent to its cost of capital. It provides a guarantee of sustainability and caters for any justifiable upgrades and investments in infrastructure for the entity. This methodology establishes the required revenue which allows for the entity to recover to its operating costs, taxes, and depreciation. In addition, the use of efficiency variables as part of this approach would largely address some of the concerns within the broader rate of return methodologies, especially where a claw back is included in the formula.

3. Marginal Cost pricing

Marginal cost pricing refers to the practice of setting the price of a product/service to equal the additional cost of producing an extra unit of output. Through this pricing methodology a company charges for each product/service sold, only the addition to total cost resulting from materials and labour used. Firms often favour this method of pricing during periods of low sales or low asset utilization in order to gain whatever incremental profit is on offer. The marginal cost pricing method takes into account the expenses required to be spent in the future to provide one more unit of a product/service; therefore, the marginal cost reflects future expenses. Reflecting future expenses provides clear signals to both sellers and consumers on the true value of the product/service consumed.

A tariff which is based on marginal cost requires that the relationship between variable costs and expected throughput demand be known for the period during which the price will prevail. It is therefore necessary to estimate the change in resource productivity as demand increases. Pricing at marginal cost provides for consumption up to the point where the marginal cost of producing an additional unit is equal to the marginal benefit gained from its consumption. Marginal cost can be estimated in either a long-run or a short-run perspective. The major difference between short-run marginal cost and long-run marginal cost is the time frame and the company's ability to adjust its production process to minimize costs for a given level of demand. In the calculation of short-run marginal costs, capital costs are excluded because they are fixed in the short run. Long-run marginal costs include capital costs as these can be adjusted in the long run. Setting tariffs based on short-run marginal cost will therefore not be truly reflective as a large cost namely infrastructure investment will be omitted.

3.1. Short-run Marginal Cost Pricing

The setting of prices equal to short-run marginal cost would result in companies recovering only the marginal cost of supplying an additional unit unless capacity constraints are applied. When capacity

constraints are applied, prices should be set to ensure that the market will clear and that the revenue that is generated should be used to fund an increase in supply. With prices that are based on short-run marginal cost, prices can be considerably variable, being very low most of the time and very high when capacity constraints apply. The theoretical background of marginal cost pricing is that if the price exceeds the cost, too little of the product/service will be produced and resources will be used inefficiently to produce other products/services, alternatively if the price is below the cost, too much of the product/service will be produced relative to the quantity of other goods/services. The decision to price at short-run marginal cost will depend on the cost of changing the price. If it is assumed that it costs very little to change the price, then the short-run marginal cost is an appropriate basis for pricing. Alternatively, if the price is costly to change, then a long-run marginal cost basis is appropriate.

3.2. Long-run Marginal Cost Pricing

Long-run marginal cost pricing on the other hand incorporates the cost of future infrastructure investment. This inclusion provides for more stable pricing while also providing a price signal of increasing costs as the need for system improvement approaches. The concerns raised earlier about the high variability of prices under short-run marginal cost based pricing has led to a preference for pricing based on long-run marginal cost because of the stability which it provides. A company which does not see future investment as necessary would have a long-run marginal cost which is equal to short-run marginal cost.

3.3. Incremental Cost Approach

A variation of the Long-run marginal cost called the incremental cost approach can be used as a marginal cost basis. The incremental cost approach relates to larger increments of output. Incremental cost refers to an increase in a company's total cost as a result of producing a good/service instead of the cost of producing just the marginal unit of that good/service. Long-run incremental cost based pricing has become the dominant methodology for setting regulated interconnection charges in telecommunications markets around the world.

3.4. Limitations of Marginal Cost Pricing

Marginal cost pricing has some problems however. Firstly, it is difficult to estimate marginal costs, particularly the estimation of short-term and long-term marginal costs, this has been discussed in detail in the published tariff strategy. Marginal cost pricing should be based on competitive market principles. South Africa's port industry is monopolistic in nature. Strictly setting price equal to marginal cost is best only in a perfectly competitive free economy, anything less would result in mistakes being made; taxation will distort prices and political pressures will begin to have a strong influence on prices. Although marginal cost pricing is economically efficient, flexible and one of the fairest pricing tools on paper it has severe limitations which make it difficult to implement practically.

Advantages

1. It provides the lowest price possible
2. It is arguably the fairest pricing method if done correctly
3. It provides enough revenue for future capital expenditure
4. No excessive profits made by the regulated entity

Disadvantages

1. There is a high possibility of incorrect pricing
2. It is a highly theoretical model and difficult to calculate
3. It Does not ensure appropriate cost recovery for the utility, which is caused by the fact that the marginal cost tends to be lower or higher than the average cost of supply
4. It could lead to over investment if capital cost estimation is too high

4. The Price Index Approach

CPI-X regulation involves setting a price-path for a utility allowing for changes in inflation (the CPI factor) and expected efficiency improvements (the “X” factor). The “X” factor may incorporate other aspects in addition to the expected improvement in efficiency, such as rewards for improvements. In output quality, service levels or demand management actions.

Regulators aim to set prices/revenues along a path that will generate sufficient revenue to recover the efficient levels of OPEX and CAPEX, with a reasonable after-tax return on capital. The price path is set for a specified number of years, commonly referred to as the ‘regulatory control period’ or the ‘determination period’.

The traditional approach to CPI-X regulation involves resetting the price path towards the end of the determination period, with the new prices based on forecasts of efficient costs expected to be incurred in the next control period. These costs may differ significantly from those on which the previous price path was based.

CPI-X can limit price increases using the formula CPI-X

- X is the amount by which they have to cut prices in real terms
- If inflation is 3% and X=1%
- Then firms can increase actual prices by $3-1=2\%$

Advantages

1. CPI calculated monthly
2. An appropriate price index can be used
3. Regulated entity allowed to outperform regulators assumptions

Disadvantages

1. It is costly and difficult to decide what the level of X should be.
2. Strong cost cutting incentives tend to result eventually in lower levels of quality of supply
3. Volume volatility may see large corrections after the review period
4. Large capex requirements might require intermediate reviews of the tariff.

5. Performance/Yardstick regulation

A methodology which ties in with the Price Index approach is Performance Regulation, which provides the X factor (efficiency gains) in the CPI estimation.

Yardstick regulation is an incentive regulation tool which can take a number of different forms. It has the advantage that, under some conditions, regulated entities are incentivised to reveal their true costs and to behave in an efficient way. Under this methodology, the regulated company would be rewarded if they performed better than the yardstick and punished if their performance is worse than the yardstick.

Given that it is usually necessary to take into account particular characteristics of the regulated companies; yardstick regulation is often used in conjunction with top-down benchmarking techniques. This method involves setting targets for cost reduction that are independent of the actual cost reduction achieved by the company over the regulatory review period, but instead are dependent on the performance of the “benchmark”.

The allowed revenues in period 1 (AR) are calculated on the basis of the allowed revenues in the previous period (AR), corrected to take into account the X factor and the quality factor (Q) in addition to inflation(CPI).

Performance-based tariffs provide an incentive for a company to improve its efficiency and reduce its costs. The return to a company under this system is dependent on its performance. Instead of prescribing a return, the regulated company is given a set of performance criteria which include both financial and operational criteria. Performance-based tariffs can take on many different forms such as price cap, revenue cap and profit sharing methods. Under these forms maximum prices or revenue are established for a certain period and the regulated company can retain profits within the cap. Such a profit retaining mechanism provides the necessary incentive to a regulated company to reduce its costs and improve its efficiency.

Performance-based tariffs promote efficient behaviour from the users of a facility. Efficient behaviour is accomplished by using a facility optimally at a level which takes into consideration the time the facility is used and how long users should wait before accessing the facility.

Performance-based pricing typically follows a rough pattern where the tariff is increased when the level of utilization is above optimum and decreased when the level of utilization is below optimum. When facilities are operating at high levels of utilization, congestion builds up which makes using the facility very expensive for users because of high delay costs. In order to avoid reaching such a point, the tariff moves in line with the level of utilization of the facility. Surcharges can also be introduced during peak periods in order to ease congestion at a facility. When the level of utilization of facilities is well below the optimum level, the tariff should prioritize the building up of trade. In order to build up trade, performance-based tariffs result in a price that covers only marginal or variable costs. Such tariffs might not be high enough to cover the costs of the facility, therefore alternative methods or tariffs need to be sought in order to recover costs. A subsidy could be introduced as a cost recovery tool.

Performance-based tariffs extend far beyond entering a facility as they can be used to encourage users to follow efficient practices while occupying the facility. In the context of a port for example, discounts on the published tariff can be offered to ships that begin to work almost immediately after berthing and on the contrary fines could be given to those ships that only begin to work after a prolonged stay at a berth in order to punish users for the inefficient use of a facility. Such pricing practices can be extended beyond the waters of a port and can be applied to storage facilities.

6. Hybrid Performance Based Tariff Methodology with Price Cap Methodology

In a well-designed performance based tariff methodology, good performance should lead to higher profits, while poor performance should lead to lower profits. In general, performance based tariff methodologies provide companies with a fixed price or a fixed level of revenues as opposed to a predetermined level of profits. Companies can therefore earn higher or lower profits depending on how efficiently they operate. Performance based tariffs are often combined with the price cap methodology where prices are put in place for longer periods with an intension for users to reduce costs.

Another hybrid of performance based pricing is a combination with CPI-X. This system allows prices or revenues to rise by the rate of inflation minus an efficiency factor (X) which reflects the potential of the regulated company to improve efficiency.

Performance based tariffs can also be designed using the revenue cap tariff methodology. The revenue cap is based on revenue earned in the previous year with adjustments for inflation, customer growth and productivity.

Overall Advantages and Disadvantages of Performance Based Tariffs:

Advantages

1. Encourages operating efficiency
2. Reduced analysis burden for the regulator
3. Benefits shared between utility and consumer
4. Consumers protected from short term market fluctuations
5. Once the tariff is determined it remains in place for some time, thus providing stability in the tariff structure
6. There is less risk of over-investment by the utility
7. A definite incentive for cost minimisation and improving service quality can be built into the system
8. Efficient port users are rewarded
9. Inefficient operators are punished
10. Less abuse of monopoly power by utility
11. More efficient use of facilities
12. Potential for great profits if performance improves
13. An effective performance based system may reduce the need for frequent tariff filings by the utility, which would lead to reduced administrative costs
14. Cross-subsidization from efficient to inefficient divisions

Disadvantages

1. Incentive to lower service quality to increase profits
2. Less public input in tariff review process
3. Potential for political fallout (for the regulator) as a result of higher than expected utility earnings
4. Potentially undesirable cross-subsidies
5. Reduction in efficiency incentives close to cap review
6. Unless the system is carefully designed, there may be an incentive for the regulated entity to lower service quality while pursuing monetary incentives in other areas
7. Higher prices in times of port congestion
8. No gains to be made if performance criteria is unrealistic
9. Exogenous factors can influence performance
10. Lower prices in times of low port congestion (if incorporating congestion charges)
11. Too many rewards to industry stakeholders could threaten financial stability of utility
12. Difficult to prevent cross-subsidization
13. Exogenous factors can influence performance
14. Regulator's reviewing power is relinquished

7. Cost Plus Approaches

The Cost Plus approach is a tariff methodology which sets the price of a product/service according to its production costs plus a mark-up.

The mark up, which reflects the profit the entity will earn on a product sold or service rendered, is added either as a form of a percentage of the actual costs of the product/service or as a fixed monetary value onto the actual costs of the product/service. In general practice, entities will set a mark-up based on similar products or services provided by similar entities. Entities, however, are not restricted to this practice, and may establish their own mark-up percentages or fixed monetary values.

There are number of different Cost plus approaches.

Types of Cost Plus Approaches:

- Costs Plus Pricing Approach

This is the most common method adopted by companies, which is stated and outlined above.

- Costs plus Contract Approach

This tariff methodology is used to establish the fee contractors will be awarded for their services rendered. In general practice, the contractor will be allocated a set limit for allowed expenses plus a mark-up which is based on the type of contract entered into between the parties to the contract.

Cost -plus Fixed fee contract- a predetermined fee the contractor will earn is established and agreed upon at the time of the formation of the contract.

Costs- plus- percentage fee contract- the contractor will earn a mark-up (i.e. profit) in the form a percentage of the costs incurred.

Costs-plus- incentive & award fee contract- performance targets are attached to the price the contractor receives. The contractor will receive higher prices if he/she meets and/or exceeds designated performance target levels.

8. Revenue Cap and Price Cap

These two methodologies combine the effects of price indexing and performance regulation to set a maximum price while allowing for efficiency gains, but most importantly allowing the regulated entity the maximum revenue it requires.

Revenue cap and price cap regulation are incentive based regulation, which is the use of rewards and penalties to induce the companies to achieve desired goals and in which the company is afforded some discretion in achieving goals. 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 incentivize the licensee to reduce costs).

8.1. Price Cap

Price Cap is a legally established maximum price that is imposed on a product or service, this price is usually below the one that would otherwise be charged by a regulated company (for example, a monopolist). Basically price cap regulation sets a cap on the price that the utility provider can charge for goods and services. It sets a price increase over a base or previous year that incentivises the regulated company to reduce costs and thereby garner more profit. Tariff increase is set at a level that makes allowance for inflation, reduced by the efficiency incentives that are required of the company.

A price cap (or ceiling) is imposed on a product or service within a market with the goal of maintaining prices below a certain level and keeping them low, presumably based on the notion that otherwise the price would be too high and that the monopolistic firm can abuse its monopoly power by charging higher prices. It was used to shift some of the risk onto the company, and incentivise the company to reduce costs. It is the most common used method of incentive regulation across the world in different sectors. Most applications of price cap regulation have been in telecommunications industries.

The cap is set according to several economic factors, such as the price cap index, expected efficiency savings and inflation. After the rising costs of inputs (inflation) and the prices charged by competitors are considered, price cap regulation is introduced to protect the consumers while ensuring that the business can remain profitable. It 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 value of X is meant to reflect potential cost savings by the firm due to either increased efficiency or technological progress.

Advantages

1. It encourages efficiency, which can be achieved through both cost reductions & technological innovation
2. It is simple to define and monitor
3. Reduces analysis burden on the regulator since prices are fixed for a longer period of time
4. The benefits are shared between the utility and consumers
5. Consumers are protected in the short term from at least some market fluctuations
6. The price cap formula explicitly improves price predictability and stability relative to other prices in the economy by aligning price changes with changes in general inflation indices

Disadvantages

1. Potential political fallout if actual utility earnings vary significantly from projections (either due to errors in setting the cap or through increased efficiencies on the part of the utility)
2. Efficiency incentives reduce significantly as the time of cap review nears

3. Less public input and lowers scrutiny of the utility due to less frequent tariff hearings
4. since the cap is set at the unit level, profitability of the utility can vary significantly if actual demand varies from projections (due to a high proportion of fixed
5. An incentive for the utility to lower service quality (or reduce social assistance programs) to increase profits.
6. Utility's significant flexibility in setting prices under the cap may result in cross-subsidies which are not socially desirable

8.2. Revenue Cap

Revenue Cap is the maximum revenue allowed to the company under this regime, company has to return any revenue beyond the level agreed to customers. Revenue cap regulation is often used as an alternative to price cap regulation. It is designed to incentivize regulated companies to increase their efficiency and provide a certain amount of revenue for the licensee.

Most applications of revenue cap regulation have been in the electricity industry and revenue caps are often assumed by regulators to have similar efficiency properties as price caps. However, there are major differences between price caps and revenue caps with respect to their theoretical implications. The main difference is of course that price caps by definition cap prices and may thus prevent monopolistic firms from using their monopoly power. Revenue caps do not necessarily cap prices. Revenue cap regulation seeks to limit the total amount of revenue received by a company operating which holds monopoly status in the industry. It is also determined according to inflation, the Consumer Price Index (CPI) and the efficiency savings factor. The licensee is generally allowed to earn its allowed revenue regardless of the level of demand.

Advantages

1. Allows constraint to respond to actual output and pass-through costs.
2. Consumers are protected in the short term from at least some market fluctuations
3. more appropriate than price cap regulation when costs do not vary appreciably with units of sales
4. In essence the same as a price cap, as both are forms of incentive regulation and the regulated entities revenue is restricted by the inflation-productivity index

Disadvantages

1. The utility may dramatically alter relative prices.
2. The utility may respond by setting price at or above the monopoly level.
3. The possibility that a small reduction in the revenue cap will produce a large and unpredictable reduction in price (an effect related to the Crew-Kleindorfer effect).
4. An incentive to reduce sales regardless of the social benefit
5. Has no incentive to increase efficiency.

Conclusion

It is clear that there is no “one-size-fits-all” methodology and that the choice of a methodology is very nuanced and requires careful consideration of the intended incentives, pricing outcomes, revenue sustainability and transparency. As such, the input of port users and other interested parties is crucial to the outcome of this process as the establishment of a tariff methodology that might apply over the next few years will have a significant impact on all and should ensure that not only the cost of doing business is reduced, but the ongoing development and sustainability of South Africa’s port system is ensured.

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All persons are invited to submit written comments by Friday, 30 September 2016.

Copies of the current Tariff Methodology may be found on the Regulator's website at http://www.portsregulator.org/images/documents/Regulatory-Manual-for-the-Tariff-Years-2015_16-2017_18.pdf.

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