

# Peer review of the reference tariff model

DBNGP (WA) Transmission  
Pty Ltd

December 2014



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# 1. Executive Summary

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This report describes the results of our testing of the DBNGP (WA) Transmission Pty Ltd (DBP) tariff model ('the Model') supporting the Revised Access Arrangement being proposed by DBP for tariffs that will apply for the period 1 January 2016 to 31 December 2020 (the next regulatory period).

In accordance with the scope, we were asked to perform three tests on the Model and report our findings.

Based on our examination of the Model and the performance of the three tests, and considering the assumptions and methodology set out in this report we conclude that:

- The results of the Capital Maintenance Principle test demonstrated that there was no difference between:
  - the Net Present Value (NPV) of the returns on and of capital for the period 1 January 2016 to 31 December 2020; and
  - the NPV of the investment in assets over the same period;when discounted by the weighted average cost of capital (defined as the allowed rate of return).
- Having performed a cell mapping process to identify the nature of the contents of the cells in the Model, no embedded values or inconsistent logic was identified in the Model that were not adequately explained by DBP or addressed in the final version of the Model.
- Our individual cell-by-cell check of the Model examined each unique cell formula in the Model, and our testing resulted in no issues, queries or errors remaining in the final version of the Model that were not adequately explained by DBP.

## 2. Introduction

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### 2.1 Background and purpose

DBP is a gas transmission business operating a gas transmission pipeline which brings natural gas from Dampier (the North West Shelf area of Western Australia) and delivers this gas to markets in Western Australia, as far south as Perth and Bunbury.

DBP services a small number of transmission customers and delivers gas to ATCO Gas Australia Pty Ltd, the gas distributor for the Perth region.

DBP is required to submit revisions to their access arrangement by 1 January 2015 for a revision to those terms and prices to commence on 1 January 2016.

DBP's proposed revisions to the access arrangement for the period beginning 1 January 2016 will base reference tariffs on a building block approach which will move from a Pre-tax Weighted Average Cost of Capital (WACC) approach to Post-tax WACC for the first time.

Whilst the Post-Tax approach will offer a different timing of the revenues received from the investments as compared to a Pre-tax approach, the net present value of the returns should be equal, all assumptions being the same, over the life of the assets.

Under the previous Pre-tax approach, there was no need for any tax related inputs to be applied in the process. Therefore the change to a Post-tax approach has triggered the need for new inputs to the calculation for the first time. The results of our examination of the Model will help DBP present a tariff model to the Economic Regulatory Authority (ERA) in support of its Revised Access Arrangement for the next access arrangement period.

#### *Purpose of this report*

The sole purpose of this report is to provide an independent assessment of the MS-Excel model that DBP have used to apply the Post-Tax methodology in calculating its forecast revenue building blocks and proposed tariffs for the next regulated period.

### 2.2 Structure of this report

This report outlines the results of our work undertaken with the purpose of responding to DBP's terms of reference, and is structured as follows:

- Section 3 outlines the approach to testing the Model as required in the scope. This comprises:
  - Section 3.1 which outlines the use of a tool to facilitate the review of the model and complete two of the three tests:
  - Section 3.2 which outlines the concept of a Capital Maintenance test and how it was applied to the testing of the Model to complete the final test.
- Section 4 details the results of the assessment;
- Section 5 is the author's statement; and
- Appendices provide supporting information.

## 2.3 Requirements of the independent report

### 2.3.1 The independent author

The author of this report is KPMG. KPMG has used the following experts to produce this report.

Robin Holmes  
KPMG  
151 Pirie Street  
Adelaide SA 5000

### 2.3.2 Training and experience

Robin Holmes' qualifications and relevant experience are set out in his CV attached at Appendix B.

### 2.3.3 The questions the expert has been asked to consider

DBP has requested the independent author to provide an assessment of the tariff Model utilising the following procedures:

- Undertake a Capital Maintenance Test of the outputs of the Model
- Review the consistency of the logic and use of embedded data within the Model, and
- Perform a cell-by-cell check of the formulae in the Model.

The **scope** of the Engagement is agreed as follows:

#### *"Part 2 – peer review of the reference tariff model"*

In reporting on the DBP Reference Tariff Model, we will carry out the following tests and report on the outcome of those tests on the model provided:

- a) Test the operation of the model in the calculation of the returns on the asset base by calculating a Capital Maintenance Principle test where the Net Present Value of the returns on an of capital and compared with the NPV of the investment in assets, when discounted by the weighted average cost of capital.
- b) Identify any embedded data and inconsistent logic in the model through the use of the Model Review Tools. This will not necessarily identify all errors, but will highlight inconsistencies and report finding for subsequent follow up by the DBP model team.
- c) A cell by cell test of all the unique formula applied in the tariff model and the presentation of issues which will be identified in a final report if unresolved."

The Terms of Reference for this engagement are set out in Appendix A.

### 2.3.4 The documents and material the expert has considered

The expert has considered information from the following sources in preparing this report on tax inputs for DBP:

- the ERA's 2014 Access Arrangement Guidelines;
- The National Gas Rules – Version 22;
- The ERA's Rate of Return Guideline; and

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- such information that, in the expert's opinion, should be taken into account to address the questions outlined above.

The specific sources of information are listed in Appendix C.

### 2.3.5 Factual Findings

The independent opinions are based on the application of a testing methodology described in section 3.

The findings are set out as follows:

- The results of the review of the consistency of the logic in the Model and identification of embedded data are provided in section 4.1
- The results of the cell-by-cell checking of unique formulae in the Model are provided in section 4.2
- The results of the capital maintenance test are provided in section 4.3

### 2.3.6 The author's opinion

The author has set out below its opinion on the question posed by the terms of reference.

This opinion is based wholly and substantially on the supporting expert's specialised knowledge.

In the author's opinion, all issues or matters identified in any of the versions of the model examined have been addressed such that no issues or queries remain outstanding, in the final Model provided as described in section 4.

### 2.3.7 The reasons for the author's opinion

The independent author has set out below the reasons for these opinions:

- Use of an automated tool – Model Review Tool (MRT) – ensures that all unique formulae are listed for checking and are identified on the maps.
- The result of the Capital Maintenance Test shows a zero difference between the NPV of the returns on and of capital, compared with the NPV of the investment in assets, when discounted by the weighted average cost of capital (the applicable rate of return). This indicates that the Model is calculating the value of the annual returns and final Regulated Asset Base (RAB) according to the rules, and that the invested capital is returned to the investor over the life of the assets.
- Testing of the unique formulae in the Model, the flow of the logic of the formula and the identification of hard coded/embedded data in the Model, did not identify any queries or errors that remain unadjusted or unexplained in the final Model.

## 3. Approach

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This section describes the method used to assess the Model in accordance with the agreed scope.

The application of the methodology allowed KPMG to perform three basic tests as outlined below, discuss the results with the DBP modelling team, consider explanations, re-examine the Model following any changes and report the findings of the final tests in this report.

### 3.1 Use of the Model Review Tool

KPMG's MRT is a proprietary MS-Excel add-in that facilitates the analysis and review of Excel models. The specific facilities within MRT that were utilised for this review to perform two of the three tests were as follows:

- Sheet mapping – every sheet in the Model was mapped to show each unique formulae<sup>1</sup> and how it was copied across/down within the model. This highlights incidents of formulae changing when they may not be expected to. The maps also identify hard coded inputs that may indicate a formula has been over-written by a hard coded number.
- Identification of all unique formulae – a list of all unique formulae in the model was created to enable the model reviewer to navigate from one to the next, and facilitate the checking of each formulae. This list also enabled recording of the results of each check and any queries issues identified for subsequent reporting to the client modeller.

### 3.2 Capital Maintenance Principle Test

The 'Capital Maintenance Principle' as an accounting concept that requires an organisation's capital base to be maintained and that there be a full recovery of the investment over the life of the asset. Capital is considered to have been maintained if the investor's capital value at the end of a period is unchanged from that at the beginning of the period.

In the context of DBP, an organisation regulated under the National Gas Rules, this concept requires that the following are equal in a defined time series.

- The Returns - NPV of the nominal returns to the organisation (on and of capital) excluding the effect of inflation on the opening capital value, plus the nominal value of capital (the RAB) at the end of the period (representing the terminal value), and
- The Investment - NPV of the opening RAB at the start of the period, plus the capital expenditure added to the capital base during the period.

This test was applied to the DBP Model by comparing the two cash flows (the Returns and the Investment) and discounting the cashflows by the allowed rate of return to determine an NPV.

There should be no difference in the NPV calculations for the test to be appropriate.

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<sup>1</sup> 'Unique Formula' – a formula within Excel that has been entered in a single cell then copied across or down to adjacent cells, allowing Excel to automatically update relative cell references as it is copied.



## 4. Factual results

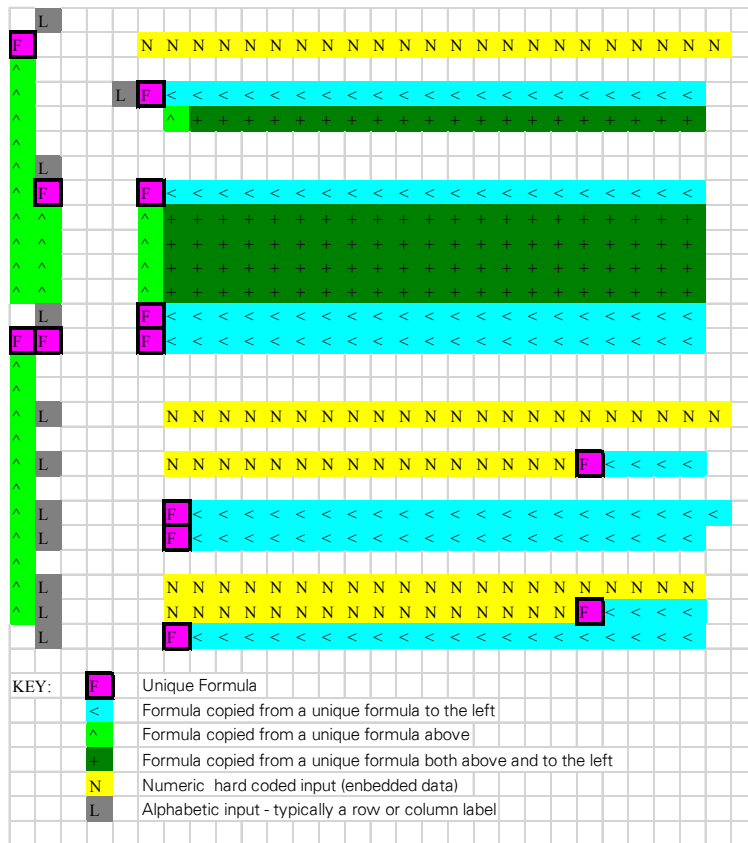
The following sections provide the results of each element of the scope of work performed for this report. The final version of the Model against which we report is described thus:

Name: DBNGP AA proposal tariff model -2015 – 141201.xls  
 Size: 1.18 MB (1,245,696 bytes)  
 Last Modified: Monday, 1 December 2014, 6:40:35 PM  
 MD5#:<sup>2</sup> 2bfe8b30bd507244d0c1512998d01d0a

### 4.1 Consistency of logic/identification of embedded data

MRT was run against the Model and the maps reviewed to identify if the formulae logic in the model may be interrupted or impacted by embedded data. An example of the maps is provided below where each square represents a cell in the associated sheet of the Model:

Example MRT Map from the DBP Model



No incidents of breaks in the logic or hard coded/embedded data were identified that were not adequately explained through further analysis of the Model or consultation with the DBP modeller.

<sup>2</sup> MD5# - a mathematically derived hash total that uniquely identifies the file.

## 4.2 Cell-by-cell check

Every unique formula identified in the Model was checked against its intended purpose within the Model (as defined by the structure and labelling within the Model) and that it appropriately applied the relevant rules for such calculations.

No issues, queries or errors were identified in the final version of the Model provided to us that were not adequately explained by DBP.

## 4.3 Capital Maintenance Principle Test

The results of the Capital Maintenance test are shown below:

Capital maintenance test							
			2016	2017	2018	2019	2020
<b>Regulated Asset Base</b>							
Opening RAB (Nominal)			3,508.28	3,497.78	3,486.43	3,471.29	3,464.40
Inflation			2.04%	2.08%	2.15%	2.21%	2.25%
Inflation on opening balance			71.57	72.75	74.96	76.72	77.95
Add inflation on opening balance			3,579.85	3,570.54	3,561.39	3,548.01	3,542.35
Add nominal capex			22.74	21.67	18.62	21.07	27.55
less depreciation			(104.81)	(105.78)	(108.72)	(104.68)	(96.81)
less disposals			-	-	-	-	-
Closing balance			3,497.78	3,486.43	3,471.29	3,464.40	3,473.09
Closing balance from DBNGP calculations			3,497.78	3,486.43	3,471.29	3,464.40	3,473.09
<b>Capital maintenance test</b>							
	<b>WACC</b>	<b>NPV</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Returns from assets</b>							
Return on Asset (WACC x RAB)			216.81	216.16	215.46	214.53	214.10
Return of Asset (Reg Deprn)			104.81	105.78	108.72	104.68	96.81
Less inflation on RAB			(71.57)	(72.75)	(74.96)	(76.72)	(77.95)
Closing RAB							3,473.09
Total returns (and NPV)	6.18%	3,601.47	250.05	249.19	249.22	242.49	3,706.05
<b>Investment</b>							
Original assets		3,508.28	3,508.28				
Capex (Discounted by one year)	6.18%	93.19	22.74	21.67	18.62	21.07	27.55
Total investment (and NPV)		3,601.47					
Difference		-	(Difference should be zero)				
<i>(Note - there is no depreciation or return on assets for capex in the year of addition)</i>							

The objective of this test is to confirm that the returns from assets (that is the return on assets and the return of assets) as applied in the forecasting methodology presented in the model, delivers the required return over the life of the assets, such that there is no windfall gain or loss to the business or the customers.

No difference was noted between the Net Present Value (NPV) of the returns on and of capital for the period 2016 to 2020 and the NPV of the investment in assets over the same period, when discounted by the weighted average cost of capital (represented by the rate of return as calculated in accordance with the ERA's Rate of Return Guideline).

The reconciliation presented above demonstrates that the Capital Maintenance Test has been appropriately applied to the Model, and no issues or inconsistencies have been identified.

## 5. Author's statement

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We have prepared this report for the purpose set out in Section 2.1 of this report and it is not to be used for any other purpose without my prior written consent. Accordingly, KPMG accepts no responsibility in any way whatsoever for the use of this report for any purpose other than that for which it has been prepared.

We have made all inquiries that we believe are desirable and appropriate and that no matters of significance which we regard as relevant have, to my knowledge, been withheld from the material set out in this report.

Nothing in this report should be taken to imply that we have verified any information supplied to us, or have in any way carried out an audit of any information supplied to us other than as expressly stated in this report.

Our opinion is based solely on the information set out in this report. If we amend any conclusion on further information, we will amend the report.



KPMG

## 6. Glossary – terms used

Terms applied in this report

Term	Meaning
Allowed rate of return	This is the weighted average cost of capital allowed in the determination of tariffs in the next access arrangement period
DBP	The business running the Dampier to Bunbury Natural Gas Pipeline (DBNGP) and providing the relevant reference services for gas transmission in Western Australia on that pipeline
DBNGP	The pipeline providing the relevant reference services and defined as the Dampier to Bunbury Natural Gas Pipeline
ERA	Economic Regulatory Authority of Western Australia
MRT	Model Review Tools. A software add in used to test Excel based spreadsheets, available to KPMG.
Next regulatory period	The next regulatory period is the period 1 January 2016 to 31 December 2020
NPV	Net Present Value, the value of a cashflow discounted by a defined discount rate (where the discount rate is the WACC or Rate of Return)
RAB	Regulated asset base. Those assets that are defined to be used by the business for the provision of the reference services, and at their written down regulatory value
Rate of return	The allowed rate of return as defined in a regulatory decision. The Nominal Vanilla Weighted Average Cost of Capital
Rate of Return Guidelines	Guidelines issued by the ERA
WACC	Weighted Average Cost of Capital

## Appendix A: Terms of Reference

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The relevant components of the terms of reference are presented below.  
The engagement letter of 1 December 2014 covered two parts. This report deals with Part 2.

### 1. Scope

The purpose of the Engagement is to assist you with:

- Part 1 – a report in the form of an Independent Report Style that considers the approach adopted by DBP in estimating the corporate tax inputs as required by the National Gas Rules (NGR) 87(A) in a way that meets the requirements for forecasts and estimates under NGR 74 in support of a Post-Tax approach to the derivation of revenues for an access arrangement; and
- Part 2 – a Report in an Independent Report style that performs an independent review of the reference tariff model to conclude on specific tests as set out below.

The two parts will be reported separately.

The **scope** of the Engagement is agreed as follows:

#### *Part 1 – estimate of corporate tax*

(Part 1 is dealt with in a separate report)

#### *Part 2 – peer review of the reference tariff model*

In reporting on the DBP Reference Tariff Model, we will carry out the following tests and report on the outcome of those tests on the model provided.

- a) Test the operation of the model in the calculation of the returns on the asset base by calculating a Capital Maintenance Principle test where the Net Present Value of the returns on an of capital and compared with the NPV of the investment in assets, when discounted by the weighted average cost of capital.
- b) Identify any embedded data and inconsistent logic in the model through the use of the Model Review Tools. This will not necessarily identify all errors, but will highlight inconsistencies and report finding for subsequent follow up by the DBP model team.
- c) (Optional) – A cell by cell test of all the unique formula applied in the tariff model and the presentation of issues which will be identified in a final report if unresolved.

## Appendix B: Curriculum Vitae of expert



### Robin Holmes

#### Director

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Adelaide SA 5000

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Mob +61 407 861314  
[rholmes@kpmg.com.au](mailto:rholmes@kpmg.com.au)

#### Function and Specialisation

Economic Regulation

#### Certifications & Professional Memberships

- Bachelor of Arts in Accounting (University of SA)
- Chartered Accountant (Institute of Chartered Accountants in Australia)

#### Profile/Overview

Robin works on regulatory and industry reform matters in the utilities industries, and advising government in related matters, having previously worked in Corporate Finance, Corporate Insolvency and Audit. He specialises in advising governments, utilities and other economically regulated industries on matters of industry reform, economic regulation and pricing and funding arrangements. He has worked almost exclusively in this area since 1998 and has maintained a particular focus on the pre-tax and post-tax modelling methodologies in building block revenue calculations.

#### Experience

- *SA Power Networks* - Robin provided the technical modelling experience to a review of regulatory models for SA Power Networks as part of the support for a regulatory proposal being prepared in 2014.
- *ATCO Gas Australia* - Robin advised ATCO Gas Australia on the modeling methodology and tariff design presented in a required revenue building blocks calculation, and a tariff control document for a Gas Access Arrangement revision in Western Australia.
- *SA Water* - Robin was engaged by SA Water to conduct an examination on the revenue models used by the Essential Services Commission of SA in SA Water's last reset decision, and to be utilized in the next determination. The review will consider the approach to modelling, assessment of best practice and a technical review of the calculations applying a Post-tax revenue methodology.
- *Ergon Energy* - Robin reviewed a number of Post-tax Revenue Model issues for Ergon Energy as they considered the impact of changes to the rate of return calculations being considered by the Australian Energy Regulator.
- *APA Allgas* - Robin managed a process of developing corporate cost benchmarks to support APA Allgas Networks, a Queensland Gas Distribution business in support of a new access arrangement being submitted to the Australian Energy Regulator. The work supported an Independent Expert report submitted as part of the documents prepared for the regulator.
- *Australian Energy Regulator* – Robin examined the Australian Energy Regulator's Post-tax Revenue Model for Transmission prior to publication on the AER Website. The examination identified a number of minor inconsistencies which were corrected prior to release, and the model was enhanced by a Capital Maintenance Principle test that has survived subsequent updates, and continues to provide a confidence check on the model.
- *Networks NSW* - Robin project managed the development of a report that considered the pricing methodologies for Ancillary Network Services as prepared by Ausgrid, Essential Energy and Endeavour Energy.
- *Jemena* - Robin provided the regulatory technical support to the audit team performing an audit of a Regulatory Information Notice for Jemena. That work included matters within the Roll Forward Model (calculating the opening asset base for the RAB) that required technical support for the audit process and consideration of the rules and the Basis of Preparation as required by the RIN guidelines and the instructions and Definitions.
- *APA Goldfields Gas Transmission Pipeline* - Robin managed the process of preparing operating cost benchmarks for the APA Goldfields Gas Pipeline business corporate costs in support of a submission to the Economic Regulatory Authority in Western Australia. The report was prepared in an expert witness style format for presentation as part of the regulatory submissions supporting the access arrangement amendments.
- *Envestra* - Robin provided the quality assurance role on a tariff model developed for allocating costs across different customer segments and calculating the tariff revenues

for those customer segments. The model provided a tool to test tariff design for gas distribution tariffs for Envestra.

- *Envestra* - Robin was part of a team that provided expert witness support to the derivation of an efficient cost model for a benchmark business operating gas networks across three regions for a gas access arrangement.
- *APA Group* - Robin managed the preparation of a Corporate Cost Benchmarking report for the APA Group with respect to the Victorian Transmission Pipeline, for submission to the Australian Energy Regulator in March 2012 as part of a revised access arrangement.
- *APA Group* - Robin managed the preparation of an independent corporate cost benchmarking report for the Roma to Brisbane gas pipeline in support of an expert witness style report that formed part of a submission for the access arrangement for the Australian Energy Regulator.
- *SA Power Networks* - Robin provided the technical assistance associated with a revenue modeling theory to a technical review of the SA Power forecasting models adopting the PTRM approach and the RFM approach to revenue forecasting. The objective was to ensure that the PTRM methodology had been appropriately applied in a 15 year forecasting model for the electricity distributor.
- *State Water* - Robin assisted a modelling team examine a consultant prepared model for State Water in NSW that was attempting to follow the ACCC PTRM approach. Robin identified a number of methodological issues with the regulatory approach adopted in the modelling of the allowed revenues and reported these back to the client for subsequent assessment or correction.
- *Ausgrid* - Robin examined models and processes for the calculation of metering and ancillary services charges for Ausgrid. The engagement involved the examination of models and the compliance with the AER Framework and Approach guideline, plus documentation of the processes, resulting in an expert witness styled report under the Federal Court Guidelines.
- *Electricity transmission* - KPMG was engaged to prepare an expert witness style report for an electricity transmission business on issues relating to an opex forecasting approach in support of a regulatory reset submission. Robin led the regulatory and methodology section of that report.
- *ETSA Utilities (SA Power Networks)* - Robin managed the process of reviewing ETSA Utilities' compliance with the National Electricity Rules with respect to the tariff submission prepared as a result of the final determination on revenues published by the Australian Energy Regulator.
- *SA Water* - Robin developed a number of pricing model options for SA Water to consider in their application of an approach to the state based regulator as they entered economic regulation for the first time. The options allowed for consideration of different asset values, different price paths and different risk profiles depending on different WACC and tax approaches going forward.

## Appendix C: References

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National Gas Rules – Version 22, From the Australian Energy Market Commission, available at <http://www.aemc.gov.au/energy-rules/national-gas-rules/current-rules>

Economic Regulatory Authority, *Rate of Return Guideline* available at <http://www.erawa.com.au/cproot/11953/2/Rate%20of%20Return%20Guidelines.PDF>