Economic Regulation Authority

Response to the Consumer Reference Group's Information Request

2022 gas rate of return instrument review

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1. Introduction

This document sets out the response to the second and third questions of the CRG's information request dated February 2022.

2. Commercial investment/independent expert practice in relation to key parameters of the allowed rate of return

2.1 Questions

There is a lot of information about rate of return parameters in consultant, stakeholder and regulatory reports in the context of regulated industries. Another source of information is the views of analysts and independent experts involved in commercial investment activities, some of which may make its way into regulatory determinations as well. Information on commercial practice may be useful in understanding how market participants address the issues in applying the CAPM in particular circumstances.

Care needs to be taken in using such information to ensure that it will reasonably relate to regulated monopoly type businesses. However, there are some parameters that relate to the market as a whole and not a particular firm and some practices in estimating parameters that are still likely to be relevant.

One type of authoritative commercial information that may be helpful is independent expert reports that are legally required for the benefit of shareholders in transactions of publicly listed companies involving mergers and acquisitions, share issues and other capital transactions.

We would be interested in knowing what the ERA thinks of these reports and if it is has access to any that would contain relevant information and be of assistance.

Key issues where we would like information are:

1. Estimation of the market risk premium, including period for estimation, the use of arithmetic or geometric averages and the relationship between the risk free rate and the market risk premium.

2. The period and frequency for data in the estimation of beta.

3. The use of international beta estimates in a domestic context.

2.2 Response

As the CRG's question notes, in various regulatory contexts it has been suggested that investment practitioner valuations of energy network businesses and the assumptions applied for the inputs underlying those valuations can provide indicative estimates of efficient rates of return for regulated businesses and the parameters of those rates of return.

The ERA's working views on the method for calculating the allowed rate of return for gas transmission and distribution service providers are set out in the *2022 gas rate of return instrument review Discussion paper*, published in December 2021 (referred to throughout this document as 'the ERA discussion paper'). The working views outlined in the ERA discussion paper on the methods for estimating the parameters of the allowed rate of return do not utilise or rely on the views expressed or assumptions applied by investment practitioners in connection to individual business valuations, such as those cited in connection to transactions related to energy network businesses. However, the ERA may consider a wide range of information in the review process for the 2022 gas instrument, including stakeholder

submissions, academic literature, market data and developments, information arising from the review and any other relevant information.

Three transactions involving infrastructure businesses in Australia which have taken place recently or are currently underway are listed below. As detailed, attached to this response are the scheme booklets for these acquisitions, which contain details of independent expert valuations of these businesses. The ERA provides this information only for the CRG's reference as examples of transactions.

- Acquisition of Spark Infrastructure [Attachment 1 – Spark Infrastructure scheme booklet]

  The independent expert report in the scheme booklet assessed a range of values for Spark Infrastructure's equity and securities. The primary valuation methodology applied in the independent expert report is the discounted cash flow (DCF) method. The independent expert report also uses multiples of earnings before interest, tax, depreciation and amortisation (EBITDA) and multiples of regulatory asset base (RAB) as secondary checks on the primary valuation results.

- Acquisition of AusNet Services Ltd [Attachment 2 – AusNet Services scheme booklet]

  The independent expert report in the scheme booklet assessed a range of values for Ausnet Services Ltd's equity and securities using the DCF as the primary valuation methodology, with multiples of EBITDA and RAB used as secondary checks on the primary valuation results.

  The estimated cost of equity underlying the discount rate applied in the valuations has been derived based on the CAPM. The independent expert report discusses the CAPM and the parameters of the CAPM applied in the valuation.

- Acquisition of Sydney Airport [Attachment 3 – Sydney Airport scheme booklet]

  The independent expert report assessed a range of values for Sydney Airport's equity and securities, with multiples of EBITDA being used as a cross-check on the primary valuation results.

  The estimated cost of equity underlying the discount rate applied in the valuations has been derived based on the CAPM. The independent expert report discusses the CAPM and the parameters of the CAPM applied in the valuation.

The above independent expert reports were produced for valuation purposes for the transactions they cover. If the potential relevance of these reports for the rate of return instrument review is to be considered, the ERA would have to consider them in the context of setting an efficient regulatory rate of return under the national gas framework.

3. The price impacts of different rate of return parameters for (1) average households; and (ii) large industrial customers

3.1 Question

We would like to request the ERA be able to calculate the impact of different rate of return parameters on both the overall WACC and gas bills of (1) average or typical households; and (2) large industrial customers, in both absolute dollar and percentage change terms.

3.2 Response

Impact of different rate of return parameters on the overall WACC

Accompanying this response as Attachment 4 is an Excel file titled 'WACC calculator'. Different values for the weighted average cost of capital (WACC) parameters can be input into this file to calculate the overall WACC estimated by inputting assumed values for the rate of return parameters.

Column D of the WACC calculator contains an example calculation. In the example, assumed theoretical values for the WACC parameters have been pre-populated. The nominal after-tax WACC and real after-tax WACC calculated by applying these assumed values are 4.33 per cent and 1.93 per cent, as shown in cells D26 and D27 respectively.

Column E of the WACC calculator allows the user to calculate nominal and real after-tax WACCs by entering assumed values for the WACC parameters defined by the user.

Impact of different rate of return parameters on average households

Household gas bill composition

A household gas bill is made up of several elements, including:

- the cost of the gas consumed (as well as any production or storage costs),
- transmission costs (from where the gas is produced to the gas distribution network),
- the cost of accessing distribution networks, and
- the costs of the retailer who sells the gas.

Household gas pricing – Maximum pricing

The Western Australian State Government sets the maximum price that small use gas customers serviced by gas distribution systems in the Mid West/South West, Kalgoorlie-Boulder and the Albany supply areas can be charged each year. Small use is defined as a customer using less than one terajoule of gas per year. Small use gas customers include most household gas users and some small businesses.

The maximum price is set by the *Energy Coordination (Gas Tariffs) Regulations 2000* and consists of a fixed supply charge and variable per unit charges for actual gas consumed. The charges paid by small use gas customers can differ due to retailer discounting. The maximum price goes up by the Consumer Price Index each year.

Table 1: Natural gas pricing (non-discounted) as of 2 August 2021 for metropolitan residential customers

Charge type	Tariff including GST
Supply charge	22.23 cents per day
The first 12 units used on average per day	15.35 cents per unit
Over 12 units used on average per day	13.84 cents per unit

Source: Energy Policy WA, 'Household gas pricing' (online) [accessed 23 March 2022]. A unit of gas is 3.6 megajoules, equivalent to 1 kilowatt hour of electricity. 1 gigajoule equals 1000 megajoules.

Western Australian reference tariffs relevant to household users

The ERA sets the amount that regulated gas networks in Western Australia can charge for reference services supplied on those networks. The reference services relevant to the gas supplied to residential users in Western Australia include:

- The 'B3' reference service supplied on the Mid-West and South-West Gas Distribution Systems (GDS), operated by ATCO Gas Australia (ATCO). The B3 pipeline service is supplied to end-use customers who consume less than one terajoule of gas per year and are therefore small use customers. Households are typically covered by this definition.
  - The public version of the tariff model for ATCO's current access arrangement is available on the ERA website. The ATCO tariff model shows the calculation of the forecast reference tariffs for the reference services delivered on the GDS, including the B3 reference service, at the time of the publication of ATCO's current access arrangement (November 2019).[1] The calculated tariffs during an access arrangement period may vary from their forecast values due to the application of the reference tariff variation mechanism.[2]
  - The B3 tariff compromises of two parts:
    - Standing charge – A fixed annual charge representing the fixed costs of connection to the network. The forecast standing charge for 2020, for example, is $116.84.[3]
    - Variable charges – These represent the unit costs of gas transportation per gigajoule and vary according to the total quantity of gas consumed by the user. No variable charge applies for the first 1.818 gigajoules of gas transported. For gas transported in excess of 1.818 gigajoules up to 9.855 gigajoules, the forecast variable charge for a small use customer in 2020 is $5.39 per gigajoule.[4] For gas consumed by a small use customer in excess of 9.855 gigajoules, the forecast variable charge for 2020 is $3.60 per gigajoule.[5]

1 ATCO's current access arrangement covers its fifth access arrangement period, comprising the five years from 2020 to 2024 inclusive.

2 National Gas Rules, Rule 92.

3 Real 2019 dollars.

4 Real 2019 dollars.

5 Real 2019 dollars.

- Based on ATCO's forecast average residential usage for 2020 being 13.5 gigajoules, the distribution charges for an 'average' residential customer would be $173.28.[6]

- Reference services supplied on the Dampier to Bunbury Natural Gas Pipeline (DBNGP). From where gas is produced it is transported along the DBNGP (a transmission network) before it reaches the GDS, from where it is distributed to households. The structure of tariffs for the DBNGP is explained below. As will be explained, the cost of transporting gas on the DBNGP is dependent on the distance it is transported on the network and is therefore dependent on a customer's location.

The distribution network charge makes up approximately 26 per cent of an average household gas bill, however the exact proportion of the gas bill constituted by distribution network charges will vary from year to year.[7]

The return on the capital base building block comprises approximately 25 per cent of forecast network tariffs for the GDS for ATCO's fifth access arrangement period.[8]

The WACC and its parameters applied in the ATCO tariff model are shown in the tab 'WACC'. The parameters of the WACC shown in green-shaded cells in this tab can be changed in order to calculate what the resulting reference service tariffs, including B3 tariffs, will be given different assumed values for the WACC parameters. To run this calculation, the Excel Solver function needs to be used.

Impact of different rate of return parameters on large industrial customers

Tariff structures for industrial customers

For medium and large gas customers the ERA does not have transparency over confidential commercial contracts. Prices that retailers and wholesalers charge to these customers are not known. Furthermore, the demand of these customers varies to a significant degree depending on their business and its size. It is therefore not possible to provide information on the gas costs of medium and large gas customers.

The following section provides details of network charges for Western Australia's two regulated gas transmission pipelines, the DBNGP and the Goldfields Gas Pipeline (GGP). The customer bases of these networks include both industrial and mining customers.

Meaningful comparison of the prices paid for gas and reference services on the different regulated networks by different customers is complicated by the structures of the reference tariffs on the regulated networks. In addition, customers may also directly contract with the transmission networks on non-reference tariffs.

In any given period a user's reference tariff charges are generally the sum of a combination of the following components (note that the Full haul (T1) service of the DBNGP is not distance-based and the reference services on the DBNGP do not include a toll charge component):

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6 Real 2019 dollars.

7 The proportion of the retail bill comprised by distribution network charges is based on the regulated maximum gas retail tariffs set by the Western Australian Government. In practice, many households pay less than the regulated maximum gas retail tariffs due to retailer discounting. The retailer discounting applied for an individual household gas bill depends on the supply arrangements between individual households and gas retailers.

8 ERA analysis based on the ATCO AA5 public tariff model.

- A toll charge – A capacity-based charge. The toll charge is the applicable toll tariff multiplied by the user's firm maximum daily quantity of gas ('MDQ', in gigajoules) multiplied by the number of gas days in the period.
- A capacity reservation charge – A capacity and distance-based charge. The capacity reservation charge is the product of
  - The applicable capacity reservation tariff;
  - The distance (in pipeline kilometres) between the receipt point on the pipeline and where the gas is delivered to the user; and
  - The maximum daily quantity (in gigajoules) multiplied by the number of gas days in the period.
- A throughput charge – A throughput and distance-based charge. The throughput charge is the product of
  - The applicable throughput tariff;
  - The quantity of gas delivered during the period (in gigajoules)
  - The distance (in pipeline kilometres) between the receipt point on the pipeline and where the gas is delivered to the user.

As is explained below, the components of reference tariff charges on the transmission networks may vary based on the capacity, distance and throughput of individual users. The total transmission network charges per unit of gas delivered to industrial customers will therefore vary between customers. Because different users have different reserved capacities, are located at different distances from the receipt points on the networks and use different throughput quantities, the portions of the unit costs of gas and the total gas bills of industrial customers represented by transmission network charges will also vary between customers.

Note also that gas consumption can vary significantly between large industrial customers on the networks regulated by the ERA, and therefore it is difficult to meaningfully define an 'average' or typical large industrial customer in terms of usage.

Please note that additional charges would apply for larger customers connected to ATCO's distribution network.

Dampier to Bunbury Natural Gas Pipeline – Tariff structure

Under the current access arrangement for the DBNGP there are three reference services supplied to the pipeline's mining and industrial customer base.[9] Predominantly, industrial users utilise the Full Haul (T1) reference services and some Part Haul (P1) reference services. Mining users on the DBNGP predominantly utilise the Part Haul (P1) and Back Haul (B1) reference services.

The tariff charges for each reference service are comprised of two components, as shown in Table 2. For the Full Haul (T1) reference service, network charges are a function of capacity and throughput. For the Part Haul (P1) and Back Haul (B1) reference services, network charges are a function of capacity, throughput and the distance over which gas is transported.

[9] The current access arrangement covers the fifth access arrangement period for the DBNGP, comprising the four and a half years from 1 July 2021 to December 2025 inclusive. A description of these reference services can be found in DBP Transmission, *DBNGP Access Arrangement 2021-25 Access Arrangement Period Access Arrangement Document ERA Approved 1 April 2021*, section 3.1 to 3.4.

Table 2: DBNGP forecast reference tariffs commencing on 1 July 2021 ($2021 dollars)

Tariff component	Applicable tariff
Reference service - Full Haul (T1)	
Capacity (reservation) charge ($/GJ/day)	1.288923
Commodity (throughput) charge ($/GJ/day)	0.07995
Total ($GJ/day)	1.368873
Reference service - Part Haul (P1)	
Capacity (reservation) charge ($/GJ/day/km)	0.000921
Commodity (throughput) charge ($/GJ/day/km)	0.000057
Total ($GJ/km)	0.000978
Reference service - Back Haul (B1)	
Capacity (reservation) charge ($/GJ/day/km)	0.000921
Commodity (throughput) charge ($/GJ/day/km)	0.000057
Total	0.000978

Source: ERA, Final Decision on Proposed Revisions to the Dampier to Bunbury Natural Gas Pipeline Access Arrangement for 2021 to 2025, 1 April 2021, p. 439.

The total network charges per unit of gas delivered to customers on the DBNGP will vary between customers because different users have different reserved capacities, are located at different locations on the DBNGP and use different throughput quantities. For the same reason, the portions of the unit costs of gas and the total gas bills of industrial customers represented by pipeline charges will also vary between customers.

To illustrate the reference tariff structure for the DBNGP, Table 3 shows an example of the calculation of forecast annual reference tariffs for theoretical users of Full Haul (T1), Part Haul (P1) and Back Haul (B1) reference services on the DBNGP. The assumptions for the reserved capacity, throughput and distance between the inlet and outlet points over which gas is shipped are shown in the table. These assumed values are for illustrative purposes only and do not represent the actual capacity, distance or throughput of any particular user. Assuming 365 days a year and applying the forecast reference tariffs shown in Table 2, the theoretical DBNGP users' annual charges for gas transportation are estimated to be:

- $2.969 million for the Full Haul (t1) reference service.
- $0.637 million for the Part Haul (P1) reference service.
- $0.212 million for the Back Haul (B1) reference service.

Table 3: Annual reference tariffs for theoretical users on the GGP based on forecast reference tariffs ($2021 dollars)

Tariff components	Forecast tariff ($)	Assumption for theoretical user	Total tariff component ($m)
Reference service - Full Haul (T1)			
Capacity (reservation) charge	1.288923	6 TJ/day reserved capacity	2.823
Commodity (throughput) charge	0.079950	5 TJ/day throughput	0.146
Total annual gas transportation charges			**2.969**
Reference service - Part Haul (P1)			
Capacity (reservation) charge	0.000921	6 TJ/day reserved capacity, 300 kms distance between inlet and outlet point	0.605
Commodity (throughput) charge	0.000057	5 TJ/day throughput, 300kms distance between inlet and outlet point	0.031
Total annual gas transportation charges			**0.637**
Reference service - Back Haul (B1)			
Capacity (reservation) charge	0.000921	6 TJ/day reserved capacity, 100 kms distance between inlet and outlet point	0.202
Commodity (throughput) charge	0.000057	5 TJ/day throughput, 100 kms distance between inlet and outlet point	0.010
Total annual gas transportation charges			**0.212**

Source: ERA analysis

The return on the capital base building block comprises approximately 25 per cent of forecast network tariffs for the DBNGP for DBP Transmission's fifth access arrangement period.[10]

[10] ERA analysis based on the DBP AA5 public tariff model.

The public version of the tariff model for the current access arrangement covering the DBNGP is available on the ERA website. The tariff model shows the calculation of the forecast reference tariffs for the reference services delivered on the DBNGP at the time of the publication of DBP's current access arrangement (April 2021). The WACC and its parameters are shown in the tab 'WACC'. The parameters of the WACC shown in green-shaded cells in this tab can be changed in order to calculate what the resulting reference service tariffs will be given different assumed values for the WACC parameters. To run this calculation, the Excel Solver function needs to be used.

Goldfields Gas Pipeline – Tariff structure

Under the current access arrangement for the GGP, the tariffs for the single reference service supplied to network customers have a three-part tariff structure. Similar to the structure of the tariffs on the DBNGP, the reference tariffs for the GGP vary based on the capacity, distance and throughput of individual users.

Given that the components of reference tariff charges for the GGP vary based on the capacity, distance and throughput of individual users, the total charges per unit of gas delivered to industrial customers will vary between customers. Because different users have different reserved capacities, are located at different distances from the receipt points on the GGP and use different throughput quantities, the portions of the unit costs of gas and the total gas bills of industrial customers represented by network charges will also vary between customers.

Note also that gas consumption can vary significantly between large industrial customers on the networks regulated by the ERA, and therefore it is difficult to meaningfully define an 'average' or typical large industrial customer in terms of usage.

The forecast reference tariff components for the GGP are shown in Table 4.

Table 4: GGP forecast reference tariff components (nominal dollars)

Tariff component	Applicable tariff
Toll ($/GJ MDQ)	0.119199
Capacity reservation ($/GJ MDQ km)	0.000722
Throughput ($GJ/km)	0.000197

Source: ERA, Final Decision on Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement for 2020 to 2024, December 2019, p. 184.

To illustrate the reference tariff structure for the GGP, Table 5 shows an example of the calculation of forecast annual reference tariffs for a theoretical user on the GGP. This theoretical user is assumed to have reserved capacity of 6 TJ, throughput of 5TJ and to be located 1,000 kilometres from the receipt point on the GGP from which it receives gas.[11] These assumed values are for illustrative purposes only and do not represent the actual capacity, distance or throughput usage of any particular user. Assuming 365 days a year and applying the forecast reference tariffs shown in Table 4, the theoretical user's annual charges for gas transportation are estimated to be $2.2 million.

[11] The length of the GGP is 1,378 kilometres. APA Group, 'goldfields gas pipeline', (online) [accessed 18 March 2022]

Table 5: Annual reference tariffs for a theoretical industrial user on the GGP based on forecast reference tariffs

Tariff components	Forecast tariff ($)	Assumption for theoretical user	Total tariff component ($m)
Toll charge	0.119199	6 TJ/day reserved capacity	0.261
Reservation charge	0.000722	6 TJ/day reserved capacity, 1000 kms distance from receipt point	1.581
Throughput charge	0.000197	5 TJ/day throughput, 1000 kms distance from receipt point	0.360
Total annual gas transportation charges ($m)			**2.202**

The return on the capital base building block comprises approximately 25 per cent of forecast network tariffs for the GGP for Goldfields Gas Transmission Pty Ltd's fourth access arrangement period.[12]

The public version of the tariff model for Goldfields Gas Transmission's current access arrangement is available on the ERA website. The GGP tariff model shows the calculation of the forecast reference tariffs for the reference services delivered on the regulated portion of the GGP at the time of the publication of GGP's current access arrangement (December 2019).[13] The forecast tariffs are shown in the tab 'Revenue', rows 19 to 21. The tariffs calculated during an access arrangement period may vary from their forecast values due to the application of the reference tariff variation mechanism.[14]

The WACC and its parameters applied in the GGP tariff model are shown in the tab 'WACC'. The parameters of the WACC shown in green-shaded cells in this tab can be changed in order to calculate what the resulting reference service tariffs will be given different assumed values for the WACC parameters. To run this calculation, the Excel Solver function needs to be used.

12 ERA analysis based on the DBP AA5 public tariff model.

13 The current access arrangement covers Goldfields Gas Transmission's fourth access arrangement period, comprising the five years from 2020 to 2024 inclusive.

14 National Gas Rules, Rule 92.

List of attachments

Attachment 1 – Spark Infrastructure scheme booklet

Attachment 2 – AusNet Services scheme booklet

Attachment 3 – Sydney Airport scheme booklet

Attachment 4 – WACC calculator