



Economic considerations for interpreting the National Gas Objective

Expert report prepared by Geoff Swier for Gilbert + Tobin

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1. Introduction

1.1 Scope of work

1. I have been engaged by Gilbert + Tobin who act for Goldfields Gas Transmission Pty Ltd (**GGT**), the operator of the Goldfields Gas Pipeline (**GGP**).
2. On 17 December 2015, the Economic Regulatory Authority of Western Australia (**ERA**) released its draft decision not to approve GGT's access arrangement proposal for the 2015-19 period (**Draft Decision**). GGT and other stakeholders have an opportunity to provide further submissions to the Draft Decision by February 2016. I have been asked to prepare an expert report on questions concerning the National Gas Objective (**NGO**) of the National Gas Law (**NGL**); and the ERA draft decisions on the approaches for depreciation and cost allocation.
3. The scope of work is to provide a report setting out my expert opinion in relation to the following matters:

***Question 1** As an expert economist, do you have a particular understanding of the NGO and, if so, what is your understanding of the NGO?*

***Question 2** How should an economic regulation regime be designed to promote the NGO – that is, what features should the economic regulation regime have so that decisions on price and revenue regulation will contribute to the achievement of the NGO?*

***Question 3** Pursuant to the National Gas Rules (**NGR**), the total revenue a service provider is permitted to earn from reference services in each regulatory year of an access arrangement period is determined as the sum of the following building blocks (building blocks framework):*

- (a) a return on the projected capital base for the year
- (b) depreciation on the projected capital base for the year
- (c) the estimated cost of corporate income tax for the year
- (d) increments and decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency; and
- (e) a forecast of operating expenditure.

In your view, is the application of the building blocks framework likely or not to contribute to the achievement of the NGO and, if so, how?

***Question 4** If there is a material error in the application of the building blocks framework (i.e. an error in estimation of a component of the building blocks):*

- (a) is the outcome likely or not to contribute to the achievement of the NGO?

- (b) *what is the nature or type of consequences that may arise in such circumstances?*
- (c) *are these consequences, or the risks associated with such consequences, likely to be different depending on the nature, magnitude or direction of the error?*

Question 5 *In relation the depreciation schedule to be applied in determining reference tariffs for the Covered Pipeline:*

- (a) *is GGT's proposal to continue use of the HCA method consistent with the depreciation criteria set out in rule 89(1) of the NGR?*
- (b) *would the adoption of GGT's proposal contribute to the achievement of the NGO?*
- (c) *would changing to a CCA method (as proposed by the ERA) contribute to the achievement of the NGO?*
- (d) *if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?*

Question 6 *In relation the methodology for calculation and allocation of total revenue for the Covered Pipeline:*

- (a) *would the adoption of GGT's proposal contribute to the achievement of the NGO?*
- (b) *would changing to the ERA method contribute to the achievement of the NGO?*
- (c) *if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?*

4. I have been asked to provide a response to these questions based on my expertise as an economist, the information contained in the Draft Decision and the GGT access arrangement proposal and additional information provided by Gilbert + Tobin.
5. The full scope of work in Attachment B sets out background information on the GGP, the current access arrangement revision process, the ERA draft decisions on depreciation and cost allocation and the decision-making framework. This information is not repeated in this opinion unless it is useful in explaining specific aspects of my response.

1.2 Qualifications

6. I am a director of Farrier Swier Consulting Pty Ltd, a consulting firm which provides expert advisory and management consulting services to businesses, governments and regulators in the utility and infrastructure sectors in Australia and the Asia Pacific region. I have over 20 years' experience in the application

of economic regulation to energy network businesses, having acted as a policy maker, adviser, regulator and consultant to regulators and network businesses across the electricity, gas and other infrastructure sectors in Australia and New Zealand. I have prepared a number of expert economic reports and have been a member of dispute resolution panels.

7. I hold a Masters of Commerce degree in Economics from the University of Auckland. Currently I am a non-executive director of Trustpower (NZ). Previously I was a member of the Australian Energy Regulator (2005-08).
8. I was one of three members of an expert panel appointed by the Standing Committee of Officials of the (then) Ministerial Council on Energy to advise on the specification of the national electricity objective which was to be included in the then proposed national electricity law. The present form of the NGO was based on the work of the expert panel. My full curriculum vitae is at Attachment A.
9. In preparing this report I have been assisted by my colleagues Shaun Dennison and Linda McMillan. Notwithstanding this assistance, the opinions in this report are my own and I take full responsibility for them.

1.3 Federal Court Practice Note

10. I confirm that I have read, understood and complied with the Federal Court Practice Note on Expert Witnesses in Proceedings in the Federal Court of Australia (CM 7).

1.4 Approach to interpretation

11. The interpretation of the NGO in this expert report is within the context of the economic regulation of the entire GGP including the portion of the GGP's capacity that is 'covered' under relevant provisions of the NGL and also the portion that is uncovered.
12. This expert report requires interpretation of certain provisions of the NGL and NGR. As required by the NGL, I have adopted a 'purposive' approach¹ - that is, an interpretation that will best achieve the purpose or object of the Law. I also have had regard to 'law extrinsic material' and 'rule extrinsic material'.²

¹ In the interpretation of a provision of this Law, the interpretation that will best achieve the purpose or object of this Law is to be preferred to any other interpretation - Schedule 2, clause 7 NGL.

² Schedule 2, clause 8 NGL.



1.5 Structure of report

13. The structure of the remainder of this report follows the questions set out in the scope of work. My declaration in compliance with the CM 7 Guideline is set out in section 8.

2. Question 1: My understanding of the NGO

14. The objective of the NGL is:

...to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.³

15. This section sets out my response to Question 1 of the scope of work:

As an expert economist, do you have a particular understanding of the NGO and, if so, what is your understanding of the NGO?

2.1 The National Gas Objective

16. The NGO binds all decision makers in the revenue and tariff setting process, including the regulator – (the ERA and the Australian Energy Regulator (AER)), the rule maker - the Australian Energy Markets Commission (AEMC), and the review body - the Australian Competition Tribunal (Tribunal).

17. I note that the NGL second reading speech stated that:

The long term interest of consumers of gas requires the economic welfare of consumers, over the long term, to be maximised. If gas markets and access to pipeline services are efficient in an economic sense, the long term interests of consumers in respect of price, quality, reliability, safety and security of natural gas services will be maximised.⁴

18. The Limited Merits Review provisions in the NGL were amended in 2013. Government policy statements confirm that it is the government's intent that the long term interests of consumers 'should be the sole criterion for determining the preferable decision', both by the primary decision maker (the ERA) and by the Tribunal at merits review.⁵

³ Section 23 NGL

⁴ National Gas (South Australia) Bill 2008, second reading speech, the Hon P.F. Conlon

⁵ SCER, *Review Framework for the Electricity and Gas Regulatory Decision Making: Statement of Policy Intent*, December 2012, p 1.

2.2 Revenue and pricing principles

19. As an economist and expert in economic regulation I consider that the NGO together with the revenue and pricing principles in section 24 of the NGL (RPPs) provide the overarching framework of the parts of the NGL dealing with economic regulation of gas pipelines. The RPPs provide the next level of detail below the NGO in the hierarchy of the Law and assist in understanding the meaning of the NGO.
20. The RPPs are:
- (2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in– (a) providing reference services; and (b) complying with a regulatory obligation or requirement or making a regulatory payment.*
 - (3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes– (a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and (b) the efficient provision of pipeline services; and (c) the efficient use of the pipeline.*
 - (4) Regard should be had to the capital base with respect to a pipeline adopted – (a) in any previous (i) full access arrangement decision; or (ii) decision of a relevant Regulator under section 2 of the Gas Code; (b) in the Rules.*
 - (5) A reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates.*
 - (6) Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in a pipeline with which the service provider provides pipeline services.*
 - (7) Regard should be had to the economic costs and risks of the potential for under and over utilisation of a pipeline with which a service provider provides pipeline services.*
- Note: I have highlighted pertinent aspects to my opinion.
21. The NGL requires the regulator to take into account the RPPs when exercising a discretion in approving or making those parts of an access arrangement

relating to a reference tariff.⁶ The AEMC must take into account the RPPs when it amends the NGR.⁷

22. In the next section I discuss how each RPP promotes the NGO.

2.3 Economic efficiency

23. The NGO includes reference to ‘efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers...’ The reference to efficient investment, efficient operation and efficient use can be summarised as referring to economic efficiency. This section discusses my understanding of the meaning of economic efficiency in the context of natural gas services.
24. Economic efficiency implies an economic state in which resources are optimally allocated to serve each person in the best way while minimising waste and inefficiency.
25. It is common for economists to distinguish between three different dimensions to economic efficiency:
- a) Productive (or technical) efficiency
 - b) Allocative efficiency
 - c) Dynamic efficiency.

2.3.1 Productive efficiency

26. Productive (or technical) efficiency means that goods and services are produced at minimum cost using the least-cost combination of inputs. Productive efficiency in the context of regulated infrastructure services includes for example:
- selecting an efficient combination of capital and operating resources
 - undertaking asset management so as to optimise the economic life of existing assets
 - selecting capital assets that minimise life cycle costs
 - implementing capital expenditure projects efficiently
 - adopting least cost efficient operating and maintenance processes and techniques.

⁶ NGL, s 28(2).

⁷ NGL, s 293.

2.3.2 Allocative efficiency

27. Allocative efficiency means that the right amount of the right type of the good or service is produced and consumed, and resources cannot be reallocated in a manner that results in a higher valued bundle of outputs. Static allocative efficiency exists at a particular point in time. It is reached when consumers and producers make their decisions where the total net benefits from the use of a resource are maximized.
28. Allocative efficiency in producing gas transmission services includes setting price structures and price levels over time that are 'cost reflective' and that provide price signals to encourage consumers to use gas efficiently. This is consistent with the 'efficient use' part of the NGO.
29. Allocative efficiency also includes:
 - understanding changing market requirements and consumer and stakeholder needs and planning business investment and operations accordingly
 - adopting good demand forecasting practices that support efficient network planning expansion to meet demand and avoiding significant over or under investment.

2.3.3 Dynamic efficiency

30. Dynamic efficiency means that allocative and productive efficiency continue to be achieved over time. It concerns adaptation to changes in upstream and downstream market conditions, and changes in technology, managerial processes, and consumer tastes and encompasses efforts to improve performance and innovate. This is consistent with the long run 'efficient investment in', 'efficient operation of' and 'efficient use of' elements of the NGO.
31. Dynamic efficiency in producing gas transmission services includes:
 - monitoring and managing risk and uncertainties (including in GGTs case, demand risk) that affect allocative and productive efficiency in the future
 - acquiring and managing information that assists businesses in making better decisions
 - seeking continuous improvement in all aspects of business investment and operation practices
 - management and workforce training and development.

2.4 What economic problems does the NGL seek to address?

32. In my opinion, further guidance on the meaning of the NGO can be gained by asking the question:

What economic problems do the parts of the NGL dealing with economic regulation of gas pipelines try to address?

33. Based on my review of the law, extrinsic material and the economic literature, in my opinion there are three overarching problems that the NGL seeks to address:

- The potential for exercise of market power by gas pipelines such that price or service standard outcomes are not consistent with what would be expected from a workably competitive market in the long run - which can lead to outcomes that harm the long term interests of consumers.
- The ‘regulatory commitment’ problem. If the government does not establish a sustainable ex ante legally binding regulatory commitment for how gas pipelines are to be regulated, then this could potentially lead to outcomes that harm the long term interests of consumers.
- The economic regulation regime established to address the first two problems, if not properly designed or applied, may itself result in avoidable inefficiencies - which would lead to outcomes that harm the long term interests of consumers.

34. Each of these problems is discussed below. I set out how resolving these problems and the relevant RPPs assist in understanding the meaning of the NGO.

2.4.1 The market power problem

35. The cost function for gas transmission pipelines are typically characterised by declining costs to scale within a range of outputs. Once a gas pipeline has been constructed, capacity can typically be increased at low incremental cost for example by adding additional compressors. Once low cost expansion options have been exhausted further capacity expansions can be undertaken by pipeline looping, which typically will involve a stepwise (or lumpy) increase in the incremental cost of supply. There are also often significant amenity costs in constructing and maintaining gas transmission pipelines. These features mean it may be economically efficient (and socially desirable) to build a single gas transmission pipeline to serve a particular geographic market.

36. These circumstances give rise to concerns about the potential for the exercise of market power by a commercially motivated gas business.

37. The extent to which market power is a concern in practice depends on the specific situation including the extent of any countervailing forces that limit the ability of a gas pipeline to exercise market power.
38. Typical countervailing constraints on the exercise of market power include: countervailing market power held by consumers at the time decisions are made to invest and seek (or increase) supply from a transmission pipeline, the existence of long term contracts with consumers, competition from other existing or potential gas transmission pipelines, and competition in the energy market from other energy sources.
39. The GGP delivers natural gas from offshore gas fields in the north west of Western Australia predominantly to inland mining regions. I understand that parts of the market served by GGP are characterised by countervailing constraints on the exercise of market power including competition from other pipelines; and/or competition from other fuel sources (electricity from the South West interconnected System (SWIS), diesel, liquefied natural gas (LNG) and emerging solar and battery storage technologies). Other parts of the market served by GGP are less subject to such countervailing competitive constraints on pricing.
40. A gas transmission pipeline is likely to have significant market power where (a) it has profit maximising incentives under commercial ownership and (b) where it faces insufficient countervailing competitive constraints on pricing.
41. The incentive and the ability to exercise market power could lead to outcomes that harm the interest of consumers of natural gas directly and indirectly. The direct outcome that leads to harm includes the potential for consumers being charged excessive prices that are materially above the prices that would be expected if the market were workably competitive; being provided with unsatisfactory standards of service; or not being able to access the pipeline or to transport the amount they would like to transport. The indirect outcome that leads to harm could be reduced competition in upstream and downstream markets. High gas transmission prices for example may limit opportunities for marginal gas producers to enter the competitive upstream gas production market.
42. Therefore, a second purpose of the NGL and NGR is to determine:
 - Whether a gas pipeline has sufficient market power that it should be subject to economic regulation - the 'coverage decision'
 - If the gas pipeline is to be covered, to determine the type of economic regulation that best addresses the extent of market power (for example 'full regulation', or 'light regulation')
 - And where full regulation applies, how it should be undertaken to protect the interests of consumers from the exercise of market power by the gas pipeline business.

Conclusion

43. The reference to ‘promotion of ...the ... interests of consumers’ means, in part, setting reference tariffs in a manner that avoids the potential for the exercise of market power that leads to consumer harm (i.e., excessive prices and muted competition in upstream and downstream markets).

2.4.2 The regulatory commitment problem

44. Gas transmission pipeline businesses comprise capital intensive, durable, long lived and immovable assets. A gas transmission pipeline network with these features is typically the most efficient way to transmit gas to major consumers and distribution gas networks that distribute gas to consumers located in cities and towns close to gas supplies.
45. Economic literature and practical experience concerning infrastructure with such features suggest that in the absence of any legally entrenched economic regulation framework, public officials concerned with the short term interest of consumers may have rational incentives to make opportunistic decisions to regulate prices so as to benefit current consumers at the expense of investors.
46. Newbery, for example, states:⁸
- What would be needed to persuade investors to sink their money into an asset that cannot be moved and may not pay for itself for many years? The investors would have to be confident that they had secure title to future returns and that returns would be sufficiently attractive. Durable investment thus requires the rule of law....’*
47. In the literature on economic regulation this is known as the ‘problem of regulatory commitment’. In the absence of appropriate regulatory commitments by government, it is highly likely there will be inadequate legal protections for investors in long-term immovable assets.
48. If a gas transmission pipeline has already been constructed, a gas business may have incentives to underinvest in the pipeline in order to protect itself from the risk of financial loss resulting from the threat or reality of adverse government pricing decisions. This could result in a decline in the reliability⁹ or safety of gas supply. Both situations are likely to lead to outcomes that harm the long-term interests of consumers.
49. Therefore, in my opinion as an economic expert in economic regulation, the NGL can be viewed as a means of creating a legally binding regulatory

⁸ Professor David M. Newberry, *Privatization, Restructuring, and Regulation of Network Utilities*, MIT Press, 2002, p 27 – 30.

⁹ Reliability for Gas transmission pipelines is typically defined by contractually agreed firm capacity service obligations.

commitment. Governments have committed to a robust legal framework and independent rule making and regulatory decision making for setting gas distribution revenues and tariffs with the aim of providing legal protections to investors in long lived and immovable assets.

Conclusion

50. The reference to ‘efficiency....for the long term interest of consumers’ in the NGO means (in part) that investors in regulated gas pipeline businesses should be provided with comfort that they will have a reasonable opportunity to recover their past costs, their expected future costs and to earn a reasonable rate of return such that it is commercially attractive for them to undertake appropriate capital investment in long lived, immovable assets. If investors are not provided with sufficient comfort to undertake investment, then the resulting underinvestment will lead to inefficiency.
51. This interpretation is supported by the following RPPs:
 - Section 24(2) of the NGL which requires that economic regulation decisions should provide a service provider with a reasonable opportunity to recover at least the efficient costs the service provider incurs in providing reference services
 - Section 24(4) of the NGL which requires that economic regulation decisions have regard to the capital base from the prior period
 - Section 24(5) of the NGL which requires that a reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates.

2.4.3 The inefficient economic regulation problem

52. The third significant problem the NGL seeks to address is the potential for inefficiencies associated with the application of economic regulation itself.
53. It is well known in the economic regulation literature, for example, that a pure ‘cost of service’ form of regulation approach can lead to inefficiencies (such as ‘gold plating’)¹⁰ and not create the normal incentives for dynamic efficiency in the long run (compared with the investment and operational incentives expected to arise in a workably competitive market).

¹⁰ Also known as the ‘Averch-Johnson’ effect. Averch and Johnson showed, that if the regulator sets the regulatory rate of return above the firm’s true cost of capital, the regulated firm has an incentive to choose too much capital relative to labour. This observation sparked off a large empirical and theoretical literature exploring Averch-Johnson’ effect Behaviour of the Firm under Regulatory Constraint, Harvey Averch and Leland L. Johnson, American Economic Review, 52(5), December 1962, 1062-1069.

54. Secondly, the regulator faces the so called ‘information asymmetry’ problem. Examples of where information asymmetry problems arise include:
- it may be difficult for the regulator to know what efficient costs should be
 - it may be difficult for a regulator to know how best to structure individual tariffs for customers that provide efficient pricing signals and take account of potential future changes in the market
55. The development of incentive based regulation techniques over the past 30 years aim to create incentives for businesses to invest and operate more efficiently, and to ‘reveal’ their efficient costs, and replicate to an extent what occurs in a workably competitive market. Recent amendments to the NGL have also afforded the AER more extensive information gathering powers than had been available to prior state and territory economic regulators of energy networks.

Conclusion

56. The reference to ‘efficient investment and operation... for the long term interest of consumers’ in the NGO taken together with the RPP in section 24 (3) means (in part) that economic regulation should be implemented in a way that creates incentives for dynamic efficiency in the way a gas businesses invests and operates; and to promote efficiency by revealing information on efficient costs as occurs in a workably competitive market.

2.5 With respect to price, quality, safety, reliability and security of supply of natural gas

57. My interpretation of the component of the NGO relating to price, quality, safety, reliability and security of supply of natural gas is that it limits the types of benefits (or harm) that may be considered to only those that relate directly to the provision and consumption of natural gas services, and ignores possible external costs and benefits (for example, environmental costs and benefits¹¹).

¹¹ Costs and benefits associated with mitigating environmental externalities must therefore be internalised. The government can impose environmental regulations and the efficient cost of meeting these are then a normal cost of doing business that can be recovered by a service provider in prices.

2.6 Is there a tension between promoting economic efficiency and the long term interest of consumers?

58. A question that has arisen during the access arrangement revision process is how to interpret the respective requirements in the NGO to:

- promote economic efficiency, and
- promote the long term interests of consumers.

59. Mr Balchin states that how these two components should be read together is “not altogether clear nor settled and that this will ultimately be a legal question”.¹² He states that one way to read the NGO is that the “long term interests of consumers” component of the NGO could be applied in isolation from the “economic efficiency” component. He says that by taking the long term interests of consumers part of the NGO objective in isolation, “the case for allocating a share of joint costs is stronger than with the economic efficiency objective”. Following this approach he states:

allocating costs to the unregulated service would reduce the return that GGP was able to earn from the unregulated sales and transfer this to consumers of the regulated service (via a reduction in the reference tariff).....provided this transfer did not remove GGP's incentive for investment, then there would be an obvious benefit to customers from this action.

60. Mr Balchin is in effect suggesting that it may be appropriate for economic rent to be transferred from GGP's provision of unregulated sales to consumers of regulated services.

61. Dr Hird interpreted the above discussion as suggesting a tension between promoting economic efficiency and promoting the long term interest of consumers¹³. Dr Hird states that one potential interpretation of the NGO is that:

primacy is given to the long term interests of consumers and the reference to promoting efficient outcomes as (sic) an important, but not exclusive, means of doing so. This is a matter of legal interpretation. If this interpretation was correct then a tension between competing objectives would exist.

¹² Section 2.4.2, Incenta Economic Consulting, Cost allocation between covered and uncovered services, report for Herbert Smith Freehills, November 2014

¹³ Section 2, Report prepared for Gilbert+Tobin on behalf of GGT,, Competition Economics Group, Cost Allocation Methodology for GGP, January 2016

62. Dr Hird states that if such a tension between economic efficiency and the long term interests of consumers of natural gas exists then he would not be expert to resolve this.

No tension in the NGO between economic efficiency and long term interests of consumers

63. As an expert economist with experience in the development of the NGL and NGO and the practical application of economic regulation, it is my opinion that:
- there is no tension in the NGO between the requirement to promote economic efficiency and the requirement to promote the long term interests of consumers
 - while the NGL provides no explicit limitation on regulatory decisions that take account of the return that a service provider earns on unregulated sales this is subject to the overarching NGO requirement to promote economic efficiency
 - regulators cannot make decisions that would have the effect of transferring economic rent from provision of unregulated services to the consumers of regulated services where to do so would be materially economically inefficient - this would be contrary to the NGO.

64. The reasons for my opinion are as follows.

65. Firstly, the construction of the NGO indicates that promoting efficient investment and use of natural gas services and the long term interests of consumers are clearly linked one with the other, by the use of the word ‘for’:

...to promote efficient investment in, and efficient operation and use of, electricity services **for** the long term interests of consumers of electricity

66. There are no other considerations contained in the NGO that can contribute to promoting the long term interest of consumers (with respect to price, quality safety, etc.) other than economic efficiency.

67. Secondly the above interpretation is supported by the following passage in the NGL second reading speech (noted above):

The long term interest of consumers of gas requires the economic welfare of consumers, over the long term, to be maximised. If gas markets and access to pipeline services are efficient in an economic sense, the long term interests of consumers in respect of price, quality, reliability, safety and security of natural gas services will be maximised.

68. This passage indicates the primacy of interpreting the NGO within an economic framework which seeks to maximise economic welfare of consumers in the long term.

69. Thirdly, the NGL provides no explicit limitation on regulatory decisions that have the effect of transferring economic rent earned by a service provider from provision of unregulated services to consumers of regulated services. This means that a decision maker could potentially choose to make or permit pricing decisions that had the effect of making such a transfer (subject of course to this being legally permitted by the regulatory framework). However in my opinion such a decision is subject to at least to two limitations:
- The decision cannot result in a materially less economically efficient outcome as this would be contrary to the NGO.
 - The decision maker should be cognisant of the risk of regulatory error in making such a decision.
70. The previous paragraph refers to the absence of any explicit limitation in the NGL on regulatory decisions that have the effect of transferring economic rent earned by a service provider from provision of unregulated services to consumers of regulated services. In this report I have not considered whether, from a legal perspective, the absence of a provision authorising such a transfer would have the consequence that a decision that had such an effect could not be made. Nor have I considered whether there are any provisions in the rules that would prevent a decision that had such an effect from being made. Whether the rules contain such a limitation is an issue of legal construction and I do not express any view here as to the operation of rules in this regard.

3. Question 2: How should an economic regulation regime be designed to promote the NGO?

71. This section addresses Question 2 of the TOR.

How should an economic regulation regime be designed to promote the NGO – that is, what features should the economic regulation regime have so that decisions on price and revenue regulation will contribute to the achievement of the NGO?

3.1 Design of an economic regulation regime that promotes the NGO

3.1.1 Initial design issues

72. Initial design issues for any effective economic regulation regime are:

1. The definition of the service(s) to be regulated
2. The form(s) of regulation that should apply to regulated services
3. Where the form of regulation involves regulating prices, the basis on which this should be determined.

73. For completeness I briefly comment on the first two design issues below. The third issue is a key issue raised by the scope of work and is discussed in the remainder of this section.

Definition of service(s) to be regulated

74. One of the first steps in designing any economic regulation regime is to define the services provided by the regulated business. The different services provided by a gas transmission business can have different market characteristics: some services may not need regulation; and where regulation is justified there may be different forms of regulation that might be applied.

Form of regulation

75. Once the services that should be subject to regulation have been identified, then a decision is required on the most appropriate form of regulation to be applied to that service (or group of services). Examples of a form of regulation include:

- ‘light regulation’, for example establishing an information disclosure regime; or

- regulation of maximum regulated revenues
- price cap.

76. I understand that the decision on the form of regulation is outside my scope of work, and is therefore not discussed further.

3.1.2 A model is required to determine the total revenue requirement and reference tariffs

77. Once a decision has been made that the long term interests of consumers of particular gas transmission service(s) would be best served by regulation of total revenues, then a decision needs to be made about how to approach this task.

78. Generally a particular regulated infrastructure business will not be easily comparable to other similar businesses such that meaningful efficient market based revenue or pricing benchmarks can be readily observed. If such information were available, then benchmarking could be a simple way to determine the appropriate level of regulated revenues.

79. For gas transmission networks in Australia, there is no readily available independent market information that could inform the setting of regulated revenues in a way that could meet the objective. Each gas transmission pipeline business comprises a unique range of assets and operational functions. These unique features include the age profile and condition of the assets; the density and topography of the network; and demand characteristics. This means that the task of setting the 'right' revenue / price needs to take account of the specific characteristics of each gas transmission network.

80. When dealing with complex infrastructure with unique characteristics, economists have no way of judging what an appropriate revenue allowance would be to best meet the objective, without reference to some form of model or framework.

81. Therefore, two further design issues for an economic regulatory framework are:

- selecting an appropriate model for determining the total revenue requirement and, in turn, reference tariffs
- designing the institutional framework for applying that model.

82. I note that while it can be helpful to consider these design issues separately, the practical implementation of an economic regulation regime means these are closely interrelated decisions.

3.1.3 Principles for selecting a model and an institutional framework for regulating revenues that promote the NGO

83. In selecting a model for determining regulated revenues and an institutional framework for applying the model that would promote the NGO, I consider that an economist would look to a framework which addresses each of the matters identified previously in section 2.
84. For the reasons discussed in section 2, I consider that the model for determining the service provider's revenue requirement (as well as the institutional framework for applying the model) must be selected and implemented according to three principles.
85. First it must limit the service provider's ability to exercise market power so that price and service outcomes are consistent with what would be observed in a workably competitive market. If this principle is not met, then prices paid by consumers could be excessive, service standards could be lower than demanded by consumers and/or utilisation of the pipeline may be sub-optimal - either outcome would harm the long term interests of consumers.
86. Second it must establish and maintain a regulatory commitment, which at any point in time provides the service provider with a reasonable expectation that in future it can recover its efficient costs (including a rate of return) for regulated services. If this principle is not met, then a regulated business may not undertake needed investment - which would harm the long term interests of consumers.
87. Third it must be capable of being implemented in a way that limits as far as possible the inefficiencies that economic regulation itself can potentially create. For example, the model should seek to create incentives for economic efficiency, and encourage if possible the service provider to reveal information on efficient costs.
88. The next section describes how the building blocks approach meets each of these principles. Section 3.3 discusses the institutional arrangements that support implementation of the building blocks approach consistent with these design principles.

3.2 Building blocks approach meets principles for selecting a model for regulating revenues that promotes the NGO

89. The building blocks approach is the most common framework in Australian regulatory practice for determining regulated revenues or prices for most natural monopoly infrastructure.

90. Section 76 of the NGR requires application of the building blocks approach for determining regulated gas pipeline access arrangement (AA) revisions:

Total revenue is to be determined for each regulatory year of the access arrangement period using the building block approach...

91. I consider that the building blocks approach as it is implemented through the NGL and NGR reflects each of the principles discussed in the previous section:
- It establishes rules and transparent regulatory review processes that limit the ability of regulated businesses to exercise market power. It can be applied in a systematic way such that the information, analysis and discretions applied by the regulator are transparent and service providers and consumers can understand the basis of each constituent decision.
 - It supports a regulatory commitment by governments, which provides an assurance to regulated business that they will have a reasonable opportunity to recover their efficient costs of providing the relevant service, including a rate of return.
 - It can be implemented in such a way that it can help promote economic efficiency.

3.2.1 Other approaches for determining regulated revenues

92. It is worth noting that variations on the building blocks approach are used in other jurisdictions internationally.
93. Many states in the United States use a ‘cost of service’ (or ‘rate of return’ regulation) approach. The cost of service model reflects the first two of the design principles discussed above. However, as discussed previously in section 2.4.3 pure ‘cost of service’ regulation is considered not to provide incentives for dynamic economic efficiency.
94. A few state regulatory authorities in the United States and Canada have used the total factor productivity (TFP) methodology to inform setting the rate of change for gas distribution allowed revenues over the regulatory period.¹⁴ This approach seeks to provide stronger incentives for dynamic efficiency and potentially reduce the cost of regulation, by reducing the linkage between costs and prices. However, it may provide weaker assurances to investors about the ability to recover efficient costs over time and it may not be as effective in

¹⁴ Ontario: TFP is considered in rate setting for all distribution companies. TFP was used for rate setting for San Diego Gas and Electric and Southern California Edison from mid-1990s until 2000-01 crisis. Massachusetts: TFP has informed rate design as part of Settlement Agreement with Nstar. Source Overseas Experience with TFP in Energy Network Regulation; AEMC Framework and Issues Paper, Public Forum, 11 February 2009, Denis Lawrence, Economic Insights

constraining the exercise of market power. This approach has been considered in Australia but has not been adopted.¹⁵

3.3 The institutional framework for applying the building blocks approach

95. As noted previously the implementation of an economic regulatory regime means that the choice of model and the institutional framework for how it is applied are closely interrelated decisions.
96. Most developed countries, including Australia, have established legal frameworks that define the institutional arrangements, including the obligations and constraints on the conduct of the regulator for determining allowed revenues for regulated energy businesses.
97. As discussed by Newbery, a common goal of these legal frameworks is to create credible regulatory commitment so as to provide reasonable assurances to investors that the economic regulation model will be applied in a consistent manner over time. The approach adopted to design institutional arrangements varies, for example in relation to the level of prescription in law and regulation, the extent of discretions provided to the regulator and the role of the courts and legal precedent.¹⁶
98. In Australia the institutional arrangements have been designed to not only require the use of the building blocks approach (as discussed above) but also to:
 - require that the regulator take into account the NGO and the RPPs when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff

¹⁵ On 22 December 2011 the AEMC published its final determination in relation to a proposed rule change to allow the use of total factor productivity (TFP) methodology as an alternative economic regulation methodology to be applied by the Australian Energy Regulator (AER), in approving or amending price or revenue determinations for distribution network service providers. The Commission determined not to make the rule proposed as it considered that the market conditions necessary for its effective implementation are not yet in place. AEMC, *Rule Determination. National Electricity Amendment (Total Factor Productivity for Distribution Network Regulation) Rule 2011*

¹⁶ Newbery's survey of international practice in economic regulation shows that that regulatory institutions vary between countries "...according to their institutional endowment which include the legislative, executive and judicial institutions, norms of behaviour, administrative capacity and the degree of social consensus within their society." For example, the United States has a different tradition and approach to economic regulation of monopoly utilities than does the United Kingdom. "In the United States the regulatory compact is sustained by the separation of the judiciary and from the legislature and the executive, by the Constitution and by a well-developed body of administrative procedures that specify how regulatory agencies must behave. In contrast the United Kingdom Parliament is sovereign and can override previous legislation. The courts are however independent and well able to uphold contracts therefore the main body of the regulation is included in the license granted to the utilities. pg 55- 57 *Privatization, Restructuring, and Regulation of Network Utilities, Professor David M. Newbery, MIT Press, 2002.*

- separate the ongoing review and amendment of the rules from the application of the rules¹⁷
 - set out in the rules certain detailed requirements about how each component of the Building Blocks approach is to be applied (see section 4 below).
99. In my opinion each of these features of Australia’s institutional arrangements for gas transmission regulation have been designed to promote consistent and predictable regulatory decision making through time. They therefore help promote the long term interests of consumers by providing assurances to service providers that they will have a reasonable opportunity to recover their efficient costs (including a rate of return) through time.

3.3.1 How the regulator must make economic regulation decisions

100. This section outlines the institutional arrangements for how the regulator (the ERA or AER) must make economic regulation decisions.
101. The regulator as the primary decision must either approve or refuse to approve a service provider’s AA proposal.¹⁸ In the event the regulator refuses to approve a service provider’s AA proposal, the regulatory must itself propose revisions to the AA and make a decision giving effect to its proposal.¹⁹
102. In practice the regulator must make numerous individual decisions including:
- interpreting the relevant NGR requirements
 - developing and consulting on guidelines to assist gas pipeline businesses to prepare their AA proposals and other supporting information
 - analysing information put forward by the service provider, the regulator staff and consultants, and other stakeholders
 - exercising its discretions in interpreting relevant rules under the NGL requirement to choose the preferable decision.
103. Section 28 of the NGL sets out certain requirements the regulator must follow in making decisions and exercising its discretions on an AA proposal including:

¹⁷ The AEMC reviews and amends the rules and the ERA or AER applies the rules in making gas distribution access arrangement determinations

¹⁸ Part 8, Division 8 NGR.

¹⁹ NGR, rule 64.

- **The ERA must exercise power in a way that contributes to the achievement of the NGO.** The ERA must make decisions in a manner that ‘will or is likely to contribute to the achievement of the NGO’.²⁰ Where there are two or more possible designated reviewable regulatory decisions that will, or are likely to, contribute to the achievement of the NGO, the NGL requires that ERA must make a decision ‘that the ERA is satisfied will or is likely to contribute to the achievement of the NGO to the greatest degree and specify reasons’.²¹
- **The ERA must consider interlinked matters.** The ERA must specify the manner in which the constituent components of the decision relate to each other and the manner in which that interrelationship has been taken into account in the making of the decision.²² This is discussed further in section 4.3 below.
- **The ERA must take into account the RPPs.** The ERA must take into account the RPPs when ‘exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff’.²³

²⁰ Section 28(1)(a) NGL.

²¹ Section 28(1)(b)(iii) NGL.

²² Section 28(1)(ii) NGL.

²³ Section 28(2) NGL.

4. Question 3: The application of the building blocks framework and the NGO

104. Question 3 of the scope of work is as follows:

Pursuant to the NGR, the total revenue a service provider is permitted to earn from reference services in each regulatory year of an access arrangement period is determined as the sum of the following building blocks (building blocks framework):

- (a) a return on the projected capital base for the year*
- (b) depreciation on the projected capital base for the year*
- (c) estimated cost of corporate income tax for the year*
- (d) increments and decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency; and*
- (e) a forecast of operating expenditure.*

In your view, is the application of the building blocks framework likely or not to contribute to the achievement of the NGO and, if so, how?

105. I consider that the application of the building blocks framework as set out in the NGR is likely to contribute to the achievement of the NGO. Section 4.1 provides an overview of the building blocks approach and an overall assessment of how it contributes to the achievement of the NGO. Section 4.2 sets out an assessment of the rules that determine each building block component. I assess from an economic perspective how each rule (or group of rules) is directed at promoting particular behaviours by a gas business that are in the long-term interest of consumers or providing assurances to consumers that regulatory decisions are in their long term interests. Finally section 4.3 discusses interlinked matters, where there are logical economic relationships between different building block components.

4.1 Building blocks approach

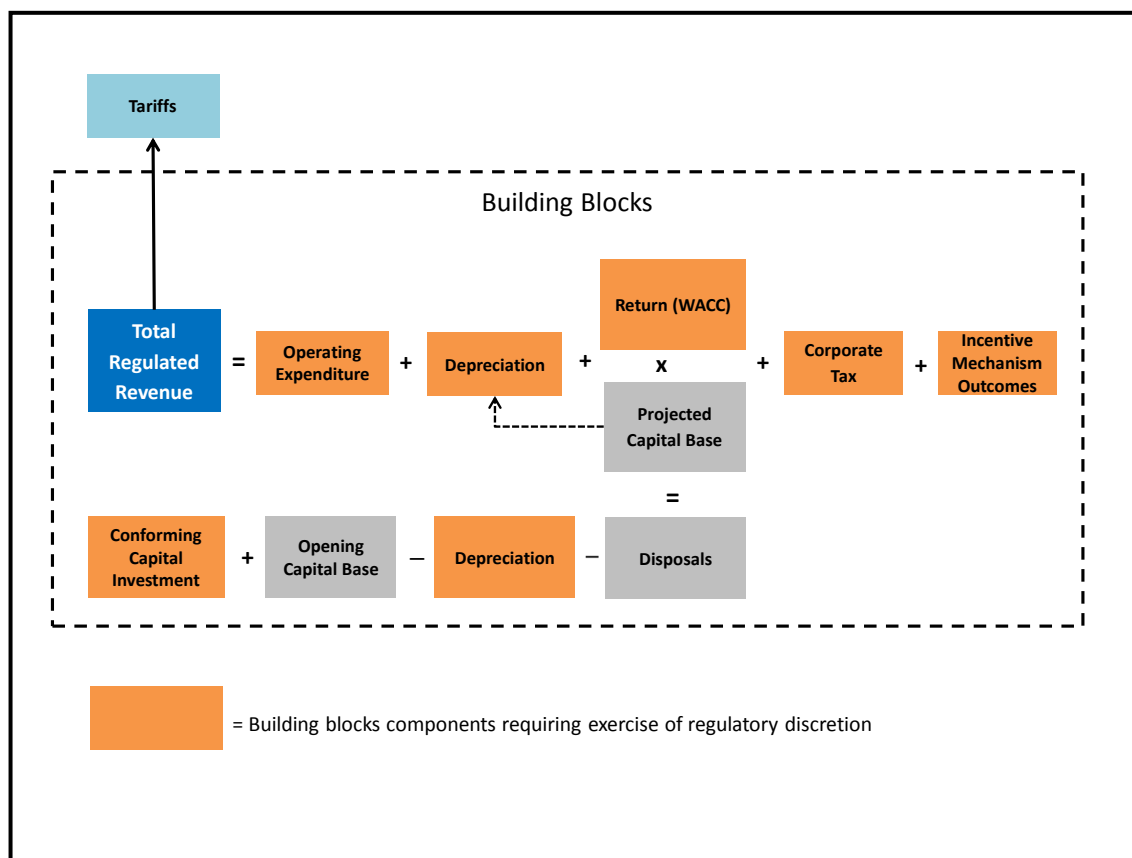
4.1.1 Overview of the building blocks approach

106. The building blocks approach is summarised in Figure 1. The building blocks approach is used to determine the total revenue requirement on an ex ante basis, typically for a five year period. The total regulated revenue requirement for each year of an access arrangement (AA) period is calculated by adding together five categories of forecast costs as shown in Figure 1. The projected capital base for each year is calculated by a roll forward model which adds

conforming actual and forecast capital expenditure to the opening capital base, and subtracts depreciation and disposals over the current regulatory period.

107. Total revenue requirements are used to determine the base year tariffs for the first year of the regulatory period and, depending on the form of price control, converted into an annual CPI - X formula for each subsequent year to escalate the base year tariffs. Not shown in Figure 1 are demand forecasts, which are an important driver in determining some elements of conforming capital and operating expenditure, and in setting tariffs.
108. Under incentive regulation, the actual expenditures within each building blocks component over the access arrangement period are not expected to exactly reflect the expenditure allowances in the AER's determination, although the AER does expect businesses to explain why differences arise. Businesses are expected to adjust to changing circumstances (such as changes in demand, and changes in costs), to reprioritise expenditures as appropriate or to reduce expenditure if efficiencies can be achieved over the AA period.
109. The establishment of the total revenue (in GGP's case) for five years in advance provides an incentive for the businesses to invest and operate efficiently. Subject to the operation of any incentive mechanism, the business is able to retain the benefit of any efficiencies achieved, or is penalised if its costs are higher than the estimate of efficient costs used to calculate the revenue requirement. This feature promotes the long term interests of consumers by creating incentives for efficiency over time (dynamic efficiency).

Figure 1 Building blocks approach



Note: This diagram summarises the key features of the building blocks approach and does not show all the interrelationships (see section 4.3.)

4.1.2 Assessment of the building blocks approach

110. As discussed in section 4, the building blocks approach is capable of being implemented in a way that it can meet each of principles for designing an economic regulatory regime that can promote the NGO. It also has the advantage that it is based on well understood concepts, and is a well-accepted approach.
111. Except for the incentive mechanism outcomes (which are unique to utility economic regulation) the building blocks approach draws on standard cost accounting and corporate finance concepts used by many types of businesses.
112. An approach to setting revenues and tariffs based on adding together blocks of costs (operating expenditure, depreciation, return on capital and corporate tax) and rolling forward the asset base is familiar and logical approach to determining target revenues and prices for any person with accounting and financial qualifications.
113. The building blocks approach is well accepted, having been used in Australia for at least twenty years, and variants of it are widely used for utility economic

regulation in other jurisdictions, in particular the United Kingdom²⁴ for monopoly energy networks²⁵ and wholesale water and waste water businesses.²⁶ It is widely accepted²⁷ that the building blocks approach is a conceptually logical basis on which to determine regulated total revenue requirements, which are then used to determine tariffs.

4.2 Assessment of rules that determine each building block component

114. This section:

1. identifies and discusses the rules that determine each building block component, and
2. discusses from an economic perspective how each rule (or group of rules) is directed at:
 - i) promoting particular behaviours by a gas business which are in the long-term interest of consumers, and
 - ii) providing assurances to consumers that regulatory decisions are in their long term interests.

4.2.1 The projected capital base

115. The rules that determine the projected capital base are outlined below. As shown in Figure 1, the projected capital base is used to calculate:

- A - return on the projected capital base, and
- B - depreciation on the projected capital base.

²⁴ From 2013, the UK regulator (Ofgem) began to implement its new Revenue = Incentives + Innovation + Outputs (RIIO) regulatory framework. The RIIO framework is designed to promote greater innovation and investment in smarter networks. The building blocks approach continues to be used to estimate efficient expenditure, but with different definition of the building blocks components. A key change is an allowance for costs expensed each year (termed 'fast' money), and an allowed return on the RAV (which incorporates the remainder of costs, termed 'slow' money). See Dr Claudia Jenkins, *RIIO Economics: examining the economics underlying Ofgem's new regulatory framework*, Florence School of Regulation Working Paper, June 2011

²⁵ See for example OFGEM 'Regulating Energy Networks for the Future: RPI-X@20 . History of Energy Network Regulation', 27 February 2009. pg 9 onwards describes the building blocks approach adopted for electricity and gas networks.

²⁶ See 'Ofwat's final methodology: now for implementation' Oxera August 2013.

²⁷ See for example, the Productivity Commission: 'The building block approach generally works well and is a suitable model for the regulation of electricity networks. although the success of (recent) changes will depend on appropriate implementation and regulatory guidelines.' Chapter 5, *Productivity Commission, Electricity Network Regulatory Frameworks Inquiry report*. 26 June 2013.

NGR rule 77: Opening capital base

116. This rule includes dealing with how the initial opening capital base is determined when a pipeline first becomes a covered pipeline. Assessing how this provision supports achievement of the NGO is complex. As a practical matter, it is not relevant to the operating circumstances of GGT as the initial opening capital base has already been determined.
117. The rules for determining the opening capital base in each period thereafter essentially set out the procedures for ‘rolling forward’ of the asset base described above.

NGR rule 78: Projected capital base

118. This rule states the procedures for rolling forward the projected asset base for the forthcoming AA period.

NGR rule 79: Conforming capital expenditure

119. This rule requires capital expenditure to be:

such as would be incurred by a prudent service provider acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost of providing services

and must be justifiable on at least one of these grounds:

- *the overall economic value of the expenditure is positive; or*
- *the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or*
- *the capital expenditure is necessary: (i) to maintain and improve the safety of services; or (ii) to maintain the integrity of services; or (iii) to comply with a regulatory obligation or requirement; (iv) to maintain the service provider’s capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.*

120. NGR rule 77, combined with rule 79(1)(a), emphasises that it is only capital expenditure that is productively efficient that will promote the objective.
121. The concept of ‘prudence’ recognises there are benefits from providing regulated businesses with certainty that, where they undertake investment on a prudent basis - which takes into account the circumstances that existed at the time the decision to undertake the investment was made - they should have some certainty around the recovery of such investments even if, assessed in hindsight, the investment may not be considered necessarily efficient.
122. NGR rule 79 recognises that ‘efficient investment and operation and use of’ is to be assessed in terms of what it delivers to consumers with respect to price,

quality, safety and reliability. NGR rule 79 is concerned with more than the very lowest possible price for consumers. It is concerned with efficiently meeting safety and other regulatory requirements. This rule also acknowledges that there are certain things a service provider may have little or no control over, in particular, externally determined standards set out in regulatory obligations and requirements. This recognises that efficient investment includes the efficient costs associated with meeting such requirements.

123. The ground for capital expenditure being justified because ‘the overall economic value of the expenditure is positive’ reflects the allocative efficiency aspect of economic efficiency. (That is, resources allocated as a result of applying this part of rule 79 would increase the value of outputs).

How these rules promote the long-term interest of consumers

124. Collectively NGR rules 77, 78 and 79 mean that any actual capital expenditure previously held to be conforming is not re-visited at the commencement of each regulatory period. This provides some assurance to investors in regulated business that the capital base will not be subsequently expropriated by the regulator. This helps provide incentives to investors to make ongoing investment in long-lived assets.
125. Together these are the principal rules that set out the way in which the capital base is determined for each year and rolled forward. These rules (and certain other rules outlined below) interact with the rules for return on capital and depreciation to determine the building block components.
126. NGR rules 77,78 and 79 contribute to achieving the NGO by:
- Enabling investments to proceed where
 - the overall economic value of the expenditure is positive
 - the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or
 - the capital expenditure is necessary: (i) to maintain and improve the safety of services; or (ii) to maintain the integrity of services; or (iii) to comply with a regulatory obligation or requirement; (iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.
 - providing an assurance to investors in a regulated business that efficient capital expenditures will be able to be recovered over the economic life of the assets. This encourages businesses to continue undertaking investments in the long term interest of consumers (allocative efficiency); and
 - benefiting consumers by providing and assurance capital expenditure forecasts are subject to regulatory scrutiny (productive efficiency)

NGR rule 80: AER’s power to make advance determination with regard to future capital expenditure

127. This rule recognises that efficient investment is promoted where service providers have greater certainty as to the recovery of their investments.

NGR rule 85: Capital redundancy

128. This rule provides that an AA proposal may include a mechanism that deals with assets that cease to contribute in any way to the delivery of pipeline services and enables them to be removed from the capital base. It also provides that an AA proposal may include a mechanism for sharing costs associated with a decline in demand for pipeline services between the service provider and consumers. Before requiring or approving a mechanism, the AER must take into account the uncertainty that such a mechanism would cause and the effect that uncertainty would have on the service provider and consumers.

How this rule promotes the long-term interest of consumers

129. This rule contributes to the achievement of the NGO by providing some assurance to regulated businesses on the treatment of redundant capital, which encourages investment in the long term interest of consumers (allocative efficiency).

4.2.2 Return on the projected capital base

130. The rate of return is multiplied by the projected capital base in each year to determine building blocks component A - return on the capital base.

NGR rule 87: Rate of return

131. This rule requires that the allowed rate of return be set so that it is:

commensurate with the efficient financing costs of a benchmark entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

How this rule promotes the long-term interest of consumers

132. The rate of return rule contributes to achieving the NGO by:

- providing an assurance to investors that they will be able to earn an appropriate risk adjusted rate of return which encourages ongoing investment, in the long term interest of consumers (allocative and dynamic efficiency); and
- protecting consumers from excessive rates of return that could be achieved through exercise of market power (allocative efficiency).

4.2.3 Depreciation

133. Building blocks component B is depreciation on the capital base. Depreciation is deducted from the opening capital base.
134. **NGR rules 88, 89 and 90** sets out: how depreciation schedules are used; the criteria for determining depreciation schedules; and calculation of depreciation for rolling forward the capital base from one access arrangement period to the next. These rules set out the basis on which depreciation is calculated for different classes of the pipeline assets constituting the capital base. These rules are considered in greater detail in section 6.

How these rules promote the long-term interest of consumers

135. The depreciation rules contribute to achieving the NGO by:
- providing an assurance to investors in a regulated business that investment will be able to be recovered over the economic life of the assets. This encourages ongoing investments to be made, in the long term interest of consumers (allocative efficiency); and
 - benefiting consumers by:
 - assuring consumers that capital expenditure will only be recovered once (allocative efficiency)
 - spreading the recovery of capital expenditure across current and future generations of consumers (allocative and dynamic efficiency).

4.2.4 Estimated cost of corporate income tax for the year

136. Building blocks component C is the estimated cost of corporate income tax for the year.

NGR rule 87A: Estimated cost of corporate income tax

137. Investors must pay corporate income tax each year from pre-tax earnings. NGR rule 87A sets out a formula to calculate an 'estimation of corporate income tax payable by a benchmark efficient entity'.
138. The formula calculates the estimated cost of corporate income tax by reducing taxable income to allow for the value of gamma (the assumed value of imputation credits). I understand that the intention of this rule is that shareholders are assumed to get some of the allowed rate of return back via imputation credits. Therefore, to avoid double counting the rules ensure that an appropriate estimate of the value of imputation credits is made and removed from the corporate tax building block.

How this rule promote the long-term interest of consumers

139. The corporate income tax rule contributes to achieving the NGO by:

- providing an assurance to investors that in future regulatory periods they will be able to recover corporate income tax costs, which encourages ongoing investments to be made in the long term interest of consumers; (allocative efficiency); and
- benefiting consumers by:
 - ensuring that consumers are not subject to double counting in the estimate of the rate of return by recognising the value of imputation credits received in the hands of shareholders, consistent with the policy intent of the Australian imputation credit system (productive efficiency)
 - assuring consumers that only a reasonable estimate of corporate income tax costs will be recovered (productive efficiency)
 - encouraging efficient management of corporate tax by setting the allowance based on a benchmark entity (rather than for example reimbursement of actual corporate income tax) (dynamic efficiency).

4.2.5 Incentive mechanism to encourage gains in efficiency

140. Building block component D consists of any increments and decrements for the year resulting from the operation of an incentive mechanism.

NGR rule 98 - Incentive mechanisms

141. This rule states that an ‘access arrangement may include (and the ERA may require it to include) one or more incentive mechanisms to encourage efficiency in the provision of services by the service provider.’ An incentive mechanism may provide for carrying over increments for efficiency gains and decrements for losses of efficiency from one access arrangement period to the next.

How this rule promote the long-term interest of consumers

142. The incentive mechanism rule contributes to achieving the NGO by providing options to encourage improvements in efficiency over time for the long term interest of consumers (productive and dynamic efficiency).

4.2.6 Forecast of operating expenditure

143. Building blocks component E is the forecast of operating expenditure.

NGR rule 91: Criteria governing operating expenditure.

144. This provides regulated service providers with an allowance for operating expenditure component of the building blocks:

Operating expenditure must be such would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services.

How this rule promotes the long-term interest of consumers

145. The operating expenditure rule contributes to achieving the NGO by:
- providing an assurance to the regulated business that efficient operating cost incurred through the regulatory period will be able to be recovered, and therefore:
 - enables the business to meet externally imposed regulatory requirements such as safety regulation (productive efficiency)
 - encourages efficient operation and maintenance of the gas network for the long term interest of consumers (allocative and productive efficiency)
 - benefiting consumers by:
 - recognising that ‘accepted good industry practice’ is likely to change and potentially improve over time (dynamic efficiency)
 - encouraging ongoing provision of reliable services (allocative efficiency)
 - assuring consumers that operating expenditure are subject to regulatory scrutiny (productive efficiency).

4.3 Interlinked matters

146. A new aspect for operationalising the NGO in decision-making is government’s policy decision that merits review should ‘consider all interlinked matters’.

147. The Standing Council on Energy and Resources (SCER) in its Regulatory Impact Statement decision on Limited Merits Review stated that:

the review process is much more narrowly focused than was the original policy intention. The original intention, as set out insection 258 of the NGL, was to allow the regulator to raise issues that could impact on the matter before the Tribunal. In practice, this has not occurred.

148. Reflecting this concern the NGL amendments impose specific requirements on the Tribunal to consider and explain how interlinked matters have been taken into account.

149. The SCER final decision is not particularly clear as to exactly what an interlinked matter is.

150. The common English meaning of ‘Interlinked’ is to ‘link two or more things to one another, one thing with something else’. Therefore, I interpret an interlinked matter to mean that there should be a logical and consistent

treatment of different constituent elements of a determination, where there are logical economic relationships between them.

151. The following sets out examples of interlinked matters where one parameter or component of the building blocks cost forecast may be interlinked through a logical economic relationship with another.

- **Capital Asset Pricing Model (CAPM).** Consistency issues often arise in the estimation of the expected return on equity using the CAPM. The AER²⁸ noted the following specific examples of consistency issues which it took into account in a 2008 review of the WACC parameters:
 - the assumed utilisation of imputation credits (gamma) affects the estimate of the Market Risk Premium (MRP)
 - the gearing ratio adopted affects the credit rating and the equity beta
 - the term of the risk free rate affects the term of the debt risk premium and the estimate of the MRP.
- **Capital and operating expenditure trade-offs.** Capital expenditures may be economically justified by substituting for operating expenditure. Alternatively replacement capital expenditures can sometimes be deferred by accepting higher operating and maintenance costs. The assessment of capital and operating expenditure should consider such trade-offs.
- **Forecast capital expenditure and forecast depreciation.** Depreciation is a function of the asset base in a given year, new capital investment added that year and the applicable asset lives. Changes in forecast capital expenditure have consequential effects on forecast depreciation.
- **Changes in demand forecasts.** These can affect expenditure forecasts, the setting of tariffs and the weighted average price path (X factor).
- **Cost of service impacts on tax:** Any cost of service change will affect the tax building block.
- **The management of risk:** through expenditure on risk mitigations, self-insurance, and external insurance.

²⁸ Pg 51 Explanatory Statement: Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters, AER December 2008.

5. Question 4: Consequences of a material error in applying the building blocks framework.

152. This section sets out my response to Question 4:

If there is a material error in the application of the building blocks framework (i.e. an error in estimation of a component of the building blocks):

(a) is the outcome likely or not to contribute to the achievement of the NGO?

(b) what is the nature or type of consequences that may arise in such circumstances?

(c) are these consequences, or the risks associated with such consequences, likely to be different depending on the nature, magnitude or direction of the error?

153. I have addressed each part of the question separately below.

5.1 Question 4(a) Material error in application of the building blocks and the NGO

154. This section sets out my response to question 4(a):

If there is a material error in the application of the building block approach (i.e. an error in the estimation of a building blocks component) ... is the outcome (of the error) likely or not to contribute to the achievement of the NGO?

5.1.1 Limitation

155. There may be legal interpretation questions that arise in responding to this question. This response is not a legal analysis but based on my understanding of the NGR as a regulatory practitioner and economist.

5.1.2 Analysis of material error

156. A material error in the estimation of a building blocks component would arise from an incorrect or mistaken application of a relevant rule²⁹ setting out how the building blocks expenditure components are to be determined (the 'building block rules'). I understand that it is also possible that an error could

²⁹ As discussed above, Part 9 of the NGR deals with the implementation of the building blocks approach.

arise if the AER does not take into account the RPPs which results in a materially different decision from one made taking account of the RPPs.³⁰

157. Based on my practical experience in economic regulation, I consider that the incorrect or mistaken application of a relevant rule will depend on the particular context of the rule; the type of analytical technique(s) that are accepted as being used to estimate the building block component; whether the analytical techniques have accepted bounds for identifying error; and the weight of evidence about the proper application of that technique.
158. A material error in the estimation of a building blocks component will logically change the calculation of the total revenue requirement, because of the additive nature of the building blocks calculation.
159. Such a difference in the calculation of the total revenue requirement will have an adverse effect on the achievement of the NGO where this has consequences that, overall, adversely affect the ability of the business to meet any of its standards and obligations or, otherwise harm the long term interest of its consumers.
160. The nature of the harm resulting from a material error to the long term interest of its consumers will depend on the relevant rule and the particular links to economic efficiency and the long term interest of consumers implied in that rule.
161. My assessment of each of the building block rules (see section 4.2) demonstrates that the way in which each rule contributes to the NGO is capable of being clearly identified.
162. Table 1 outlines examples of possible effects on the achievement of the NGO of a material error in the calculation of a building blocks component that reduces total regulated revenue.

Table 1 Examples of effects on the NGO of a material error in the calculation of a building blocks component that reduces total regulated revenue

Material error in building blocks component....	Correct application of the rule means that....	Effect of material error on long term interest of consumers
Rules for Projected capital base (NGR rules 77, 78)	...the overall economic value of the proposed expenditure is in fact positive	Allocative efficiency is reduced

³⁰ Section 28(2) NGR:- 'The AER must take into account the revenue and pricing principles when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff.'

Material error in building blocks component....	Correct application of the rule means that....	Effect of material error on long term interest of consumers
and 79)	... the expected incremental revenue to be generated as a result of the proposed expenditure does in fact exceed the present value of the capital expenditure	Allocative efficiency is reduced
	...the proposed capital expenditure is in fact necessary to maintain and improve the safety of services	Safety obligation not met
 the proposed capital expenditure is in fact necessary to maintain the integrity of services	Firm capacity service obligation not met
 the proposed capital expenditure is in fact necessary to comply with a regulatory obligation or requirement	Regulatory obligation not able to be met
 the proposed capital expenditure is in fact necessary to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred	Allocative efficiency is reduced - demand not able to be met.
	...there is not an adequate assurance to the investor that efficient capital expenditures will be able to be recovered over the economic life of the assets	Allocative efficiency reduced due to potential for lack of investment
Rule for return on the projected capital base (NGR rule 87)	...there is not an adequate assurance to investors that they will be able to earn an appropriate risk adjusted rate of return	Allocative efficiency reduced - ongoing investment is discouraged
Rule for estimated cost of corporate income tax for the year (NGR rule 87A)	... there is not an adequate assurance to investors that in future regulatory periods they will be able to recover corporate income tax costs	Allocative efficiency reduced - discourages ongoing investments
Rule for operating expenditure (NGR rule 91)	... the business may need to reduce or cease undertaking operational activities that are in fact necessary	Allocative efficiency reduced due to inability to meet service standards required by customers, or inability to meet safety of other regulatory obligation

163. A test that could be applied to determine whether the outcome of a material error is likely to contribute to the achievement of the NGO would be to identify the specific linkages between the relevant rules and the NGO, along the lines discussed in the Table 1.

5.2 Question 4(b) Nature and types of consequences that might arise

164. This section sets out my response to question 4(b):

If there is a material error in the application of the building block approach set out above what is the nature or type of consequences that may arise in such circumstances?

165. The nature or type of consequences of a material error will vary according to the circumstances and it is not possible to make any general observation. This section illustrates the nature and type of consequences by way of examples.

5.2.1 Inability to recover at least efficient costs

Example 1: A regulated business within the regulatory period is not provided the opportunity to recover at least the efficient costs it incurs in providing regulated services

166. This occurs where there is a material error in the application of the building blocks approach in a final AA determination which results in a regulated business not being provided the opportunity within an AA period to recover at least its efficient costs incurred in providing regulated services within the regulatory period.

167. For example, in relation to gamma assume that:

- the correct value of imputation credits is 0.25, but the regulator sets a value of 0.5 for this regulatory period, and
- all other building blocks are set by the regulator at an efficient level.

168. The consequences of this error for the businesses in this scenario would be that its actual benchmark cost of corporate income tax (after adjusting for imputation credits) would be materially higher than had been allowed for by the regulator.

169. As discussed, under the ex-ante building blocks approach businesses are free to spend the total revenue allowance as they see fit, and are expected to reprioritise expenditures as needed.

170. It could manage the effects of this error by either:

- seeking to maintain its target rate of return and reduce its costs at the expense of the least important outcomes, or
- reduce its rate of return to less than the return expected by shareholders.

171. If a regulated gas business was to reduce its costs then it would be reasonable to expect it not to reduce expenditure on works and activities driven by perceived safety risks or concerns. In my experience, well-managed gas businesses treat 'safety as non-negotiable.' Rather, the business would either defer or abandon plans for expenditure that it says would otherwise be efficient to undertake

currently, including expenditure to maintain network reliability or extend service to new consumers.

172. If expenditure required to support firm capacity service obligations was reduced, then potentially this may result in an increase to prices in the longer-term, as there may be a need for 'catch-up' expenditure in future periods. In addition, this catch up expenditure may be more costly overall - allowing significant swings in expenditures is typically less efficient than undertaking expenditure smoothly over time.
173. Under the second option the business may compromise its ability to attract necessary capital for future investment. In practice this may mean either deterioration in the business' credit rating and/or a diminution of equity-holders' perception of the business.
174. In addition, if the error is seen by gas business equity holders or utility investors generally as a systematic error (rather than a specific or one-off error only applying to the company) then the impacts on the ability to attract capital may be spread across the industry.

Example 2 A regulated business on an ongoing basis is not provided the opportunity to recover at least the efficient costs it incurs in providing regulated services

175. The effects of an error also depend on whether the error is expected to be repeated in future regulatory periods. This scenario is likely to have more serious consequences than a one off error that is not expected to be repeated.
176. For example, if the error discussed above in relation to imputation credits was expected to be repeated in each future regulatory period it will permanently reduce the investors' expected rate of return. The same types of choices as to how to respond as discussed in Example 1 would be open to the business but the ongoing impacts would be likely to be more serious as they would extend into each regulatory period for the foreseeable future.
177. This type of error, if it was shown to be material, would be likely to harm the future credibility of the regulatory regime with potential adverse impacts on investors' investment intentions.

5.2.2 Expenditures not adequately reviewed

Example 3: Investment and operating expenditure proposals contain imprudent or inefficient expenditure and are not adequately reviewed by the AER leading to prices being set unnecessarily high

178. If a regulated businesses' capital and operating expenditure proposals are not subject to adequate review by the regulator then one consequence could be actual rates of return being in excess of what is required to attract financing

with returns including an element of monopoly rent. Another consequence could be that the business undertakes imprudent or inefficient expenditure, with prices paid by consumers being in excess of what they should be.

5.2.3 Lack of incentives

Example 4: Regulated business is not provided with incentives for improving efficiency over time

179. Assume a regulated business is not provided with adequate incentives for improving efficiency over time.
180. The consequences of doing so could include the business not undertaking expenditure on longer term efficiency related expenditures, such as replacement and upgrading of IT systems, staff development and training, or investing in new systems and processes. The business may be able to attract financing and meet its service standards and regulatory obligations, but the consequences may be a lack of efficiency improvement in the longer term.

5.3 Question 4(c) Are risk consequences likely to be different depending on the nature or direction of the error?

181. This section addresses question 4 (c):

If there is a material error in the application of the building blocks approach set out above....are the consequences, or the risks associated with such consequences, likely to be different depending on the nature or direction of the error?

182. The short response is yes, the consequences, or the risks associated with such consequences, will often differ depending on the nature or direction of the error. Section 5.3.1 discusses historical examples of the nature of the consequences of major regulatory errors. Sections 5.3.2 and 5.3.3 discuss examples of the asymmetry of risk consequences of under-investment and lack of maintenance expenditure respectively.

5.3.1 Historical examples of major regulatory errors

183. A review of historical examples from the economic regulation literature is useful in illustrating the real world consequences where government authorities have made major errors in not providing adequate assurances to investors that they will be able to recover their efficient costs. These examples are outlined below.
184. None of these examples are specifically connected to the application of the building blocks approach, and they are probably extreme in the context of Australian experience with economic regulation.

185. They are however, a useful reminder of the relevant point that material error in the application of economic regulation – which does not provide investors with a reasonable assurance that they will be able to recover their efficient costs (as provided for in RPP section (24 (2) and in NGR rule 79) - can have very damaging consequences for the long term interest of consumers:
- In Britain in the 1870s, the Tramway Act allowed municipalities to purchase the tram companies at written down cost at the end of 21 year franchises. Trams that should have been electrified in the 1890s were near the end of their franchise. However, because the Tramway Act had no mechanism to accommodate the advent of electrification, no private company was willing to incur the considerable cost required. The outcome was that improvements for consumers and the community resulting from electrification were delayed until after the trams were taken over by municipalities.³¹
 - The British National Telephone Company refused to invest in improvements in the telephone system unless it was provided compensation guarantees for this investment after 1908 as it neared the end of its franchise in 1911.³²
 - In 1962, the Jamaican government informed the Jamaica Telephone Co. that it wished to renegotiate the terms of its licence upon its expiry in 1966. The company responded by stopping all investments.³³
 - In Bolivia, the municipality of La Paz started negotiations in 1984 over the renewal of the licence for a private electricity company which was due to expire in 1984. Due to lack of certainty on the outcome of the negotiations the company suspended all investment activity after 1984. The license was still not satisfactorily renewed by 1991.³⁴

5.3.2 Asymmetry of risks consequences of under investment

186. One commonly discussed example is the asymmetry of risk consequences for over- and under-investment.
187. RPP section 24(6) of the NGL requires that regard should be had to the economic costs and risks of the potential for under and over investment in a pipeline.

³¹ J. S. Foreman-Peck and R. Millward, *Public and private ownership of British industry, 1820–1990*. (Oxford: Clarendon Press, 1994)

³² Foreman-Peck and R. Millward op cit.

³³ Pablo T Spiller, *Institutions and Regulatory Commitment in Utilities' Privatization in Industrial and Corporate Change* 1993 pp 387-450

³⁴ Pablo Spiller op.cit.

188. The Expert Panel noted that:

There tends to be a general view in energy regulation that risks are asymmetric, and that the adverse consequences of under-investment and over-use of assets (which may lead to security of supply problems) are greater than those of over-investment and under-use).³⁵

189. Typically the direct consequential costs to consumers, and indirect costs of an event resulting from poor security of supply, are much higher for consumers already taking supply from a gas transmission pipeline because they already have invested in gas fired equipment and processes and can only switch (say to diesel oil) at very high cost.

190. An indication of the magnitude of the asymmetric risk consequences of failure in security of supply is provided by the Varanus Island incident. An explosion at the Varanus Island gas processing facility in the North West of Western Australia in June 2008 was caused by a rupture of a pipe that brought gas onshore. The Western Australian Treasury estimated that the incident cost the state economy \$2 billion. It took 12 months to repair the facilities and return to pre-incident production rates.³⁶ This economic cost is clearly far in excess of the reasonable costs of mitigating the risks of the event.

5.3.3 Asymmetry of risks consequences of lack of maintenance

191. There can also be asymmetry of risks consequences in maintenance. Consumers often value adequate reliability highly, with this valuation exceeding the incremental cost of providing reliability.

192. For example, an inquiry into electricity distribution reliability outcomes in the UK³⁷ that was undertaken by the Trade and Industry Committee of the UK House of Commons found that:

... we are less happy about the continued regulatory pressure on operational expenditure. While there may still be efficiencies to be gained by the companies, we fear that the DNOs may have to make real cuts in the amount and quality of maintenance of their networks if such pressure continues. We recognise that consumers are unhappy about recent increases in electricity bills, which stemmed from rises in generating costs; but we are aware that, in several recent major incidents, power cuts were caused either directly or in a contributory way by

³⁵ Expert Panel Review of Limited Merits Review, Stage One report 29 June 2012, p 38.

³⁶ AER, *State of the Energy Market 2009*, p 251.

³⁷ House of Commons Trade and Industry Committee, *The Electricity Distribution Networks: Lessons from the storms of October 2002 and Future investment in the networks*, First Report of Session 2004-05.



maintenance problems. We believe that consumers would be willing to pay a little extra to reduce the incidence of such power cuts.

6. Question 5: The depreciation schedule method

193. Depreciation is one of the building blocks components that contributes to determining GGT's total revenue requirement for an access arrangement period.
194. GGT proposed to continue using the Historical Cost Accounting³⁸ (HCA) method to determine the depreciation schedule. This method does not make any annual indexation adjustment to the capital base to account for inflation. GGT has applied the HCA method since its first access arrangement (AA1).
195. The ERA did not approve the HCA method and required GGT to adopt the Current Cost Accounting³⁹ (CCA) approach from the commencement of AA3. This CCA method indexes the capital base for the effect of inflation and applies a nominal rate of return.
196. These depreciation approaches are the same in terms of the allowed revenue over the life of the relevant asset. The key difference is that the methods give rise to different time profiles of capital-related revenues. The HCA method gives rise to relatively higher reference tariffs in early years of an assets life, compared with the CCA method, and relatively lower reference tariffs in later years.
197. This section sets out my response to Question 5:

In relation the depreciation schedule to be applied in determining reference tariffs for the Covered Pipeline:

- (a) is GGT's proposal to continue use of the HCA method consistent with the depreciation criteria set out in rule 89(1) of the NGR?*
- (b) would the adoption of GGT's proposal contribute to the achievement of the NGO?*
- (c) would changing to a CCA method (as proposed by the ERA) contribute to the achievement of the NGO?*

³⁸ The HCA method is also called the straight line depreciation method. See section 2.3.1 HoustonKemp Economist report prepared for Gilbert + Tobin, *Review of the ERA's draft decision on depreciation*, 29 January 2015

³⁹ The CCA method is also called straight line indexed depreciation method. See section 2.3.2 HoustonKemp Economist op cit

(d) if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?

6.1 Considerations

198. The considerations I have taken into account in developing my response discussed below are:

- the relevant context of the GGT pipeline
- economic concepts relevant to assessing how depreciation approaches contribute to the achievement of the NGO, and
- ERA considerations in the Draft Decision that in my opinion do not contribute to the achievement of the NGO.

6.1.1 Relevant context of the GGT pipeline

199. The GGT pipeline has number of particular features that are relevant to assessing how alternative depreciation schedule methods contribute to the achievement of the NGO. These are:

- a) The majority of the market for GGT's gas pipeline services is characterised by a relatively small number of large customers primarily involved in the mining of natural resources. I understand a small portion (around 4% currently) of the market for gas pipeline services provided by GGT comprises small gas customers in Kalgoorlie supplied by a gas distribution network, and small electricity consumers in Esperance supplied with electricity by a gas fired electricity generator.
- b) It is reasonable to expect that the large customers are relatively sophisticated and generally able to manage their risks and interests. This is in contrast to pipelines that predominately supply small customers who cannot so easily manage their interests and where the regulator arguably may play a legitimate a role in determining the profile of reference tariffs over time.
- c) The market for gas pipeline services in future years is subject to significant uncertainty - demand uncertainty and uncertainty as to the ability of customers to pay for pipeline services is higher than for most other gas pipelines that supply more stable loads.
- d) I understand that currently there is no expectation of any expansion of the covered pipeline in the short term. Houston states:

Of some significance to the matter at hand is the absence of any current or expected unmet demand that would necessitate an expansion to the covered pipeline. This is consistent with empirical evidence to the effect that: the GGP

*has operated at or near to capacity for the last decade; and no material growth is forecast in demand for reference services, and reference tariffs have been determined so as to be consistent with that expectation.*⁴⁰

- e) I understand from GGT that there is limited scope for a material contraction in the market for reference services in AA3, AA4 and much of AA5, since the foundation or major contracts underpin the current near full utilisation of the covered pipeline. These contracts generally involve a commitment to take or pay for the relevant capacity; and do not expire until 2029, at the earliest. Such contracts provide a high level certainty on future revenues in that period, though they are subject to a level of counterparty credit risk that could result in failure of take or pay obligations.

Further, I understand from GGT that it has secured customers for capacity on the covered pipeline that recently became available.

6.1.2 Economic efficiency

200. As discussed in section 2 above, the achievement of the NGO is promoted by adopting an approach to setting the depreciation schedule which promotes economic efficiency.
201. In my opinion there are three aspects of economic efficiency that are relevant to assessing how alternative depreciation schedule methods contribute to the achievement of the NGO:
- a) pricing conditions that promote static allocative efficiency
 - b) promoting allocative efficiency over time (dynamic allocative efficiency)
 - c) promoting productive efficiency over time (dynamic productive efficiency).
202. These are discussed below.

6.1.3 Pricing conditions that promote static allocative efficiency

203. Allocative efficiency is satisfied at a point in time where the revenue generated by reference tariffs is between:
- a) an upper bound, which is the point at which all existing users could procure the same capacity at a lower total cost (stand alone cost), and

⁴⁰ Section 2.2 , HoustonKemp Economist report prepared for Gilbert + Tobin, *Review of the ERA's draft decision on depreciation*, 29 January 2015

- b) a lower bound, which is the incremental or avoidable cost caused by the relevant service.
204. This pricing condition is not contentious and accepted by ERA and the various economic consultants.
205. Allocative efficiency is promoted by enabling a regulated service provider to engage in price discrimination. Price discrimination occurs where a service provider recovers its total costs by setting tariffs by varying prices according to the responsiveness of a customer's demand to price:
- a) Tariffs for customers whose demand is insensitive to price can be set at level that is at (or close to) standalone cost.
 - b) Tariffs for customers whose demand is sensitive to price can be at a level that is at (or close to) incremental or avoidable cost.
206. Setting prices in this way promotes allocative efficiency in pipeline use and investment because it minimises disincentives for customers whose demand is sensitive to price to use available pipeline capacity, or to enter to contracts that support investment in expanding pipeline capacity.

6.1.4 Promoting allocative efficiency over time

207. Allocative efficiency should be encouraged over time. This means that:
- a) The above pricing conditions that promote static allocative efficiency should be met continuously over time.
 - b) The setting of prices including price discrimination should adjust as the context and market conditions change.

6.1.5 Promoting productive efficiency over time

208. As discussed in section 2.3.1 above, the achievement of the NGO will be promoted where capital expenditure is productively efficient over time.
209. As noted the HCA approach produces lower capital revenues towards the end of an asset life than the CCA approach.⁴¹ The ERA raise concerns about productive inefficiency as follows:

For example, under the HCA approach, there may be an incentive for a service provider to dispose of assets or ignore maintenance near the end of the useful life because the return on and of this asset would be relatively small and considerably lower at that time than under the CCA approach.

⁴¹ See for example Figure 28 on page 268 of the Draft Decision.

Under the HCA method, the early replacement of the asset would provide a higher return on and of the asset to the service provider than it was getting on the previous asset.⁴²

210. My response to the ERA assessment is as follows.

Theoretical incentives for early replacement under HCA and CCA methods

211. Firstly I consider under what conditions there may be incentives for a regulated business to propose early inefficient replacement of a single asset or group of assets, which is very near to the end of its useful life under either the HCA or CCA methods. (The more realistic situation is where a pipeline comprises a mix of interdependent assets of different vintages, which is considered below). In doing so I am also assuming there are no long term contracts in place.
212. Under either method, the written down value of an asset in the regulated asset base will be very low (a few percent of replacement value). This in turn means the quantum of return on the written down asset will also be low (a few percent of the return that can be earned on the replacement value of the asset)
213. Whether or not a regulated business has incentives to propose inefficient early replacement of assets near the end of their useful life depend on the:
- Extent to which the regulated cost of capital is in excess of the businesses actual cost of capital
 - Relative attractiveness of deploying capital to replace assets early compared to other available investment alternatives.
214. If the cost of capital determined by the regulator is sufficiently in excess of the businesses' actual cost of capital, and it was commercially attractive (compared to other alternatives) to deploy available capital to early replacement of existing assets, then there may be a material incentive for the regulated business to propose early replacement of assets towards the end of their useful life. In these circumstances a business can create value for shareholders by earning a larger quantum of additional return per dollar of capital employed.
215. Therefore, I consider the ERA's concern about inefficient incentives for early replacement of assets towards their useful life could exist. However I consider that the circumstances in which the concern arises are more limited than assessed by the ERA.

⁴² Paragraph 1245 **Draft Decision**

Comparing the theoretical incentives for early replacement under HCA and CCA methods

216. Secondly, I have assessed the relative incentives for early replacement under the HCA and CCA methods.
217. If there are circumstances that create incentives for early replacement of an asset (or group of assets) towards the end of its asset life cycle then the incentives are relatively stronger under HCA than CCA. This is because the difference (towards the end of an assets life) between replacement value and the written down value is larger under the HCA approach than for CCA.⁴³

Benefits of CCA in practice

218. However, I think that in practice the concerns raised by the ERA, and the claimed benefits of CCA, are overstated.
219. Firstly, and most importantly, the perceived incentives for early replacement of assets is a common regulatory challenge that is routinely dealt with by regulators in gas access arrangement reviews (and also electricity network price determinations) and in my opinion is generally an effective and well-functioning process.
220. Rule 79 of the NGR (conforming capital expenditure) was discussed in section 4.2.1 above. As noted this requires capital expenditure to be incurred by a prudent service provider acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost of providing services.
221. It is my experience that:
- Regulators (based on technical advice) may reject some of the capital expenditure proposed by a service provider under this rule, in part because they assume a longer remaining economic life for older assets than has been assumed by the service provider, and
 - once the access arrangement is determined, the regulated business has incentives to effectively manage its old assets during the access arrangement period including to meet its service standards and safety requirements.
222. Secondly, in practice the total RAB value of an ageing gas pipeline at any point in time will comprise a mix of assets of various different vintages. There will be old assets, new assets that were recently replaced, and a range of vintages in between. This is because assets may have been originally constructed at different

⁴³ See Figure 26, Page 267 Draft Decision

times; the economic life of different asset classes varies; and the process of replacing old assets occurs smoothly over time to order to minimise service disruption. From a service delivery and technical perspective there is generally significant interdependence between new and old assets. For example, a newly replaced asset in a pipeline may have no value if old assets elsewhere in the pipeline system are poorly maintained and incur a high risk of failure, or are prematurely removed. The entire fleet of pipeline assets must be managed recognising such interdependencies so as to meet relevant service standards and safety requirements. Therefore, the ERA's concern that a business could dispose of assets or ignore maintenance is in my view unlikely in practice.

223. Thirdly, if there are incentives for early asset replacement then these may be limited by any long term customer contracts. The businesses' incentives for how it manages assets (including early replacement of assets at the end of their useful life) depend on the combined effect on incentives of regulated access arrangements and contract terms and conditions. To the extent that GGT revenues are determined by long term contracts that are not influenced by the incentives discussed above, then any incentives for early asset replacement will be lessened.

Conclusion

224. My conclusion on the ERA's claimed advantage for CCA in promoting productive efficiency over time is as follows:
- In the limited circumstances where the business's actual cost of capital is materially less than the regulated cost of capital, and there are attractive opportunities to deploy capital to replace assets early compared to other investment alternatives then there may be a theoretical advantage for CCA;
 - The theoretical advantage of CCA is limited in practice because of:
 - rule 79 of the NGR which promotes well established and effective processes of technical review by the regulator of the service provider's capital expenditure proposals and especially the proposed remaining useful lives for older assets
 - the fact that a relatively old gas pipeline comprises a mix of assets of different vintages (old and new) and the pipeline is generally a system of interdependent assets, and
 - incentives for early asset replacement may be limited by long term contracts with customers.
225. I consider that some weight should be given to the benefits of CCA in providing improved incentives for early replacement of assets near the end of their useful life, but in practice the benefits are unlikely to be large. It may be possible to undertake more detailed analysis to support this assessment but I have not done so.

6.1.6 ERA considerations that do not contribute to the achievement of the NGO

226. This section sets out my response to certain considerations the ERA took into account in coming to its decision on the depreciation method that I consider do not contribute to the achievement of the NGO. These are:

- HCA creates subsidies between current and future consumers.
- HCA may create price shocks.
- Low tariffs induced by HCA may produce unsustainable investment by consumers.

HCA creates subsidies between current and future consumers

227. The ERA is concerned that the HCA method:

*...drags forward depreciation revenue in real terms from the second half of an assets life leading to **real subsidies from current consumers to future consumers** which is not in the long term interest consumers, counter to the NGO.⁴⁴*

228. The ERA position raises the following questions:

- How are subsidies between current and future consumers defined and in what circumstances would subsidies be contrary to the NGO?
- Are there other reasons to be concerned about the relative level of prices paid by current and future customers?

229. It is my understanding that pricing theory states that prices are defined as being 'subsidy free' provided they are no greater than stand alone costs and no less than incremental or avoidable cost (see section 6.1.3 above).

230. As noted above, allocative efficiency (and therefore the long term interest of all consumers) is promoted by enabling a supplier to engage in price discrimination between its customers subject to prices being within the upper and lower bound.

231. Provided reference tariffs are set within the range of incremental or avoidable cost, and standalone cost then such tariffs are defined as 'subsidy free'. Subsidies between current and future customers would only arise if on a forward looking basis some reference tariffs might reasonably be expected to be set below incremental or avoidable cost or above standalone cost.

⁴⁴ Paragraph 1219 Draft Decision

232. I understand that GGT's proposed depreciation schedule produces average prices over time that lie within the bounds of incremental or avoidable cost, and standalone cost. This follows from the fact that average prices are the product of the building blocks cost model. Since prices lie within the bounds of incremental or avoidable cost, and standalone cost they are therefore subsidy free. Accordingly I disagree with the ERA's position that the application of the HCA method leads to subsidies from current consumers to future consumers. The ERA has adopted an incorrect definition of subsidy.

HCA may induce price shocks

233. As noted above, the ERA considered that the CCA method avoids price shocks for consumers that would arise under HCA when major assets reach the end of their effective life and are replaced.
234. It is not clear whether the ERA consider this feature would promote the NGO. I consider below whether choosing a depreciation method that avoids price shocks is relevant to promoting the NGO.
235. Firstly, the ERA does not establish what it means by 'price shock' and whether in fact the HCA method will create price shocks.
236. As noted above, in practice the total RAB value of an ageing gas pipeline will comprise a mix of assets of various different vintages. This is likely to smooth out step ups in capital related costs when assets that reach the end of their useful life are replaced.
237. Putting aside the question of understanding whether price shock is an actual problem, in my experience in utility regulation particular circumstances can give rise to significant increases in prices; and setting prices in a way that avoids or mitigates price shocks could potentially be a relevant factor that a regulator considers for promoting the achievement of the NGO.
238. In my view these circumstances include where:
- a group of consumers may have made plans and decisions based on certain assumptions about future prices, and where subsequently these plans are materially disrupted by unexpected and material increase in prices, such that they incur significant economic loss; and
 - the consumers are not in a good position to forecast or manage the risk of such price increases (such as through long term contracts)
 - it is reasonable to expect that that major assets will be substantially replaced at the end of their effective life with similar assets (such as for most gas or electricity distribution networks).
239. I am aware of examples in the past where electricity prices for small consumers (households, commercial customers) have been restructured leading to a significant unexpected price increase for some customers. In these examples,

regulated prices have been set so as to smooth out price increases over time, on the basis that this approach assists consumers to better adjust to the change in prices. If these benefits are material, then this could be said to promote the long term interest of consumers.

240. I am not persuaded that avoiding price shocks would promote the NGO in the current case (determining reference tariffs for the GGT). As noted above the market participants supplied by GGT are predominantly large sophisticated businesses, with a small proportion of the market comprising small end use customers.
241. For the large customers:
- Any price changes from replacing major pipeline assets should be manageable because they can be readily forecast in advance and can be factored into each customer's planning
 - Such large sophisticated customers typically enter into long-term contracts with commercially negotiated tariffs. If they desire price stability over the term of their contracts, they can negotiate this outcome.
242. For the small end use customers of GGT, their suppliers should also be able readily forecast in price changes advance and factor this into planning. In addition there should also be opportunities for entering into long-term contracts with commercially negotiated tariff that provide greater price stability if this is desired.
243. Further, it is not obvious that all parts of the GGT should necessarily be replaced with similar assets at the end of their life. For GGT customers involved in the mining of natural resources, there may potentially be choices about what to do at the end of the life of major pipeline assets such as: to not replace assets; to defer decisions to replace assets and increase maintenance expenditure; or replace existing assets with significantly different assets. If such future investment and operating choices exist then allocative efficiency (and the achievement of the NGO) could be promoted by encouraging consumers to participate in making these choices by them facing the full price impact of their demand decisions and the resulting effect on the cost of supply.

Low tariffs induced by HCA may produce unsustainable investment by consumers

244. The ERA states that:

HCA depreciation schedules provide for price paths that encourage inefficient utilisation of assets, that is, under or over utilisation of the asset at different times in its life cycle....

*This may be facilitated by the **artificially low tariffs** induced by the HCA method near the end of the assets life. Downstream users may be induced to invest on the basis, only to find that such tariffs were unsustainable.⁴⁵ (Emphasis added)*

245. I disagree with the ERA view above that the HCA method produces ‘artificially low tariffs’. As discussed above, the average reference tariff produced by the HCA method lies between the upper bound (stand alone cost) and the lower bound (incremental or avoidable cost) and therefore complies with the pricing conditions for static allocative efficiency.
246. I am not persuaded that in the case of the GGT pipeline that there is a valid concern that downstream users may be induced to invest on the basis of low tariffs only to find that such tariffs were unsustainable.
247. Firstly, as noted above, the actual time profile of reference tariffs paid by consumers will be influenced by a total RAB which will be made up of a mix of old assets and newer assets. The actual time profile of reference tariffs is not likely to be as volatile as implied in the Draft Decision (see Figure 28 on page 268).
248. Secondly, large consumers supplied by the GGT pipeline are predominantly sophisticated users and it is reasonable to expect that they are in position to understand and anticipate future changes in reference tariffs, and avoid making inefficient investment decisions.

6.2 Question 5(a) Is the HCA method consistent with rule 89(1) of the NGR?

249. This subsection sets out my responses to question 5 (a):

is GGT’s proposal to continue use of the HCA method consistent with the depreciation criteria set out in rule 89(1) of the NGR?

250. The depreciation criteria set out in rule 89(1) of the NGR are:

The depreciation schedule should be designed

- (a) so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services; and*
- (b) so that each asset or group of assets is depreciated over the economic life of that asset or group of assets; and*

⁴⁵ Paragraph 1245 Draft Decision

- (c) so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets; and
- (d) so that (subject to the rules about capital redundancy), an asset is depreciated only once (i.e. that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the AER permits, for inflation)); and
- (e) so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.

251. My assessment of the consistency of the HCA method with the depreciation criteria focuses on the criterion for promoting efficient growth in the market for reference services (rule 89(1)(a)) which has been the main point of contention. For completeness, I assess the other depreciation criteria (rule (1) (b) - (e)) noting that there has been no contention about compliance of the HCA method with these criteria.⁴⁶

6.2.1 Promoting efficient growth in the market for reference services

252. Rule 89 (1) (a) of the NGR requires that a depreciation schedule should be designed so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services.
253. This rule implies an evaluation of different potential depreciation schedules over the entire economic life of the relevant assets (not over the next access arrangement period).⁴⁷
254. Growth should not only be considered in a positive sense, i.e. in terms of an expansion in the market for reference services, but also in a negative sense, i.e. in terms of avoiding contraction.⁴⁸

⁴⁶ ERA acknowledges that HCA complies with rules 89 (1) (b) to (e). See Paragraph 1211 ERA Draft decision on Proposed Revisions to the Access Arrangement for the GGP

⁴⁷ Section 2.2, HoustonKemp Economist report prepared for Gilbert + Tobin, *Review of the ERA's draft decision on depreciation*, 29 January 2015

⁴⁸ Paragraph 1217 Draft Decision

Expansion in the market for reference services

255. As noted in section 6.1.1, I understand that no expansion of the covered pipeline is expected in the short term. Recent capacity expansions have taken place on the uncovered pipeline.
256. This means that where a different reference tariff is created by the choice of depreciation schedule approach, it is unlikely to have any practical effect on providing incentives for growth in covered pipeline services. Any growth in the demand for pipeline services will be accommodated by the uncovered pipeline.

Mitigating the risk of contraction in demand for reference services

257. As noted in section 6.1.1, there is limited scope for any contraction in the market for reference services prior to AA5 since the covered pipeline is contracted to near full capacity and major contracts underpin the current near full utilisation of the covered pipeline
258. This means that it is only in the longer term (post 2029) that different time profiles for reference tariffs resulting from a depreciation schedule approach may mitigate the risk of contraction in the demand for reference services.
259. A depreciation schedule approach that produces relatively low reference tariffs in the longer term (post 2029) would better mitigate the risk of contraction in the demand for reference services.

6.2.2 Other depreciation schedule criteria

260. Table 2 assesses compliance of the HCA method with other depreciation criteria (rule 89(1) (b) - (e)).

Table 2 Assessment of compliance of the HCA method with rule 89 (1) (b)-(e)

Criterion	Rule	Assessment
<p>Depreciation over the economic life The depreciation schedule should be designed so that each asset or group of assets is depreciated over the economic life of that asset or group of assets.</p>	89 (1) (b)	<p>HCA complies with criterion HCA sets the allowance for depreciation over the economic life of an asset equal in current dollars of the day terms, in each year of an asset's (or group of assets') projected economic life.</p>
<p>Allow for adjustment for changes in the economic life The depreciation schedule should be designed so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets.</p>	89 (1) (c)	<p>HCA complies with criterion Allowance for depreciation for all future years can be adjusted if there is a change expected in the economic life of a particular asset (or group of assets).</p>
<p>Asset is depreciated only once The depreciation schedule should be designed so that (subject to the rules about capital redundancy), an asset is depreciated only once (i.e. that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the AER permits, for inflation)).</p>	89 (1) (d)	<p>HCA complies with criterion HCA produces a clear accounting value for each year of the remaining undepreciated value of an asset or group of assets. This ensures that an asset or group of assets can only be depreciated once.</p>
<p>Allow for service provider's reasonable needs for cash flow The depreciation schedule should be designed so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.</p>	89 (1) (d)	<p>HCA complies with criterion Whether a HCA based depreciation schedule provides for a service provider's reasonable needs for cash flow is a specific matter that requires financial analysis. Noting that GGP has not raised concerns with the adequacy of cash flows under HCA, I assume that it meets this criterion.</p>

6.3 Question 5(b) Would the GGT proposal to adopt HCA contribute to achievement of the NGO?

261. This sub section provides my response to question 5(b):

In relation to the depreciation schedule to be applied in determining reference tariffs for the Covered Pipeline...would the adoption of GGT's proposal [to adopt the HCA approach] contribute to the achievement of the NGO?

Finding – The HCA approach contributes to achievement of the NGO

262. I consider the GGT proposal to adopt the HCA approach for calculating the depreciation schedule for the purpose of determining reference tariffs for the covered pipeline will contribute to achievement of the NGO for the reasons that were discussed above and summarised below.
263. **The HCA approach provides regulatory certainty and provides incentives for investment.** Depreciation for each asset is recovered over its economic life enabling the service provider to fully recover its initial investment. This contributes to providing regulatory certainty to the service provider and thereby encourages investment. This feature contributes to promoting the long-term interest of consumers.
264. **The HCA approach ensures customers pay the minimum in deprecation costs over the economic life of an asset.** Assets are depreciated only once. This feature contributes to promoting the long-term interest of consumers.
265. **The HCA approach is consistent with allocative efficiency.** HCA produces reference tariffs that are consistent with the pricing conditions that promote static allocative efficiency. The average reference tariff produced will lie between the upper and lower bound (standalone cost and incremental or avoidable cost). Allocative efficiency promotes the long term interest of consumers.
266. **The HCA approach enables flexibility.** HCA enables adjustment for changes in the economic life of an asset. This feature contributes to prompting the long-term interest of consumers.
267. In addition the HCA approach (compared to CCA) has the advantage that it better mitigates the risk of contraction in demand for GGT services in the long run. This feature also contributes to promoting the long-term interest of consumers.
268. The HCA approach does not creates subsidies between current and future consumers, and so this is not a relevant factor.
269. In relation to the issue of price shocks, it is not clear that this is an issue in practice. If it were a potential concern, I note that the GGT customers are sophisticated businesses that are capable of forecasting and managing any changes in reference tariffs. In addition, allocative efficiency may be promoted by enabling consumers to participate in making choices about asset replacement by facing the full price impact of their demand and supply decisions.

6.4 Question 5(c) Would changing to a CCA method contribute to achievement of the NGO?

270. This sub section provides my response to question 5(c):

In relation to the depreciation schedule to be applied in determining reference tariffs for the Covered Pipeline... would changing to a CCA method (as proposed by the ERA) contribute to the achievement of the NGO?

Finding - CCA approach would contribute to achievement of the NGO

271. I consider the ERA proposal to adopt the CCA approach in determining reference tariffs for the Covered Pipeline would contribute to achievement of the NGO for the reasons discussed in detail above and summarised below.
272. **The CCA approach provides regulatory certainty and provides incentives for investment.** Depreciation for each asset is recovered over its economic life enabling the service provider to fully recover its initial investment. This contributes to providing regulatory certainty to the service provider and thereby encourages investment. This feature contributes to promoting the long-term interest of consumers.
273. **The CCA approach ensure customers pay the minimum in deprecation costs over the economic life of an asset.** Assets are depreciated only once. This feature contributes to promoting the long-term interest of consumers.
274. **The CCA approach is consistent with allocative efficiency.** CCA produces reference tariffs that are consistent with the pricing conditions that promote static allocative efficiency. The average reference tariff produced will lie between the upper and lower bound (standalone cost and incremental or avoidable cost). Allocative efficiency promotes the long term interest of consumers.
275. **The CCA approach enables flexibility.** CCA enables adjustment for changes in the economic life of an asset. This feature contributes to prompting the long-term interest of consumers.
276. In addition, the CCA approach (compared to HCA) has a theoretical advantage in that it provides somewhat less incentive to replace assets early in their economic life, though in practice this advantage is reduced by rule 79 of the NGR.
277. The CCA approach does not limit subsidies between current and future consumers, and so this is not a relevant factor.
278. For the CCA approach, the same considerations as for HCA apply in relation to potential for price shocks.

Assessment of cash flow impacts of changing to the CCA approach

279. The ERA required that the CCA depreciation method be applied from the commencement of AA3 (but not retrospectively)⁴⁹. The ERA notes their proposal to adopt the CCA method will reduce revenues in AA3 by some \$30 million (2014 dollars) or 15 percent compared to the HCA method. This reduction would be offset by an increase in cash flows in future years.
280. As noted, above rule 89(1)(d) of the NGR requires that the depreciation schedule should be designed to allow for the service providers reasonable need for cash flow to meet financing, non-capital and other costs.
281. Adverse short term cash flow impacts could potentially affect the achievement of the NGO. For example, if an unexpected change in depreciation method had material adverse financial impacts that reduced the incentives for GGT to invest.
282. In my view, assessment of compliance with 89(1)(d) of the NGR requires financial analysis including the impact of the change in approach on credit metrics and whether there is any consequential costs in adjusting financing arrangements (for example, an increase in future debt raising costs not able to be recovered through the determination of the cost of capital building block component).
283. Assessment of whether an unexpected change in depreciation method affected the achievement of the NGO (in terms of incentives to invest) would also require financial evidence or analysis. I am not expert to undertake either assessment.
284. I understand that an assessment of the impact on the NGO of changing the profile of future cash flows arising from changing depreciation method has not been undertaken by ERA. Therefore, I consider that there is some doubt about the effect on the NGO from adopting the CCA method.

6.5 Question 5(d) Would HCA or CCA contribute to the achievement of the NGO to the greatest degree?

285. This section sets out my response to question to question 5 (d):

if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?

⁴⁹ Paragraph 1264 Draft Decision.

Finding - Both HCA and CCA contribute the achievement the NGO

286. As discussed in the previous two sections, I consider both HCA and CCA contribute to the achievement the NGO. In essence both approaches support the fundamental characteristics of good economic regulation that contribute to the achievement of the NGO. Both approaches:

- provide regulatory certainty to investors about capital cost recovery over the economic life of assets which thereby promotes investment being undertaken when required
- ensure customers pay the minimum in depreciation costs over the economic life of an asset
- are consistent with the pricing conditions that promote allocative efficiency, and
- enable flexibility where there are changes in asset economic lives.

Finding - selecting between HCA and CCA involves trade-offs

287. Table 3 below draws on the earlier analysis and summarises the key aspects about the depreciation approaches that are relevant to the GGT context, and compares and contrasts the two approaches in terms of which approach contributes to the achievement of the NGO to the greatest degree.

Table 3 Comparison of HCA and CCA methods

Dimension of economic efficiency	Criteria	Depreciation schedule approach to be applied in determine reference tariffs for the Covered Pipeline		Which method contributes to the NGO to the greatest degree ?
		HCA	CCA	
Allocative and dynamic efficiency	Efficient signalling to customers for pipeline expansion where demand exceeds current capacity	Not relevant	Not relevant	No difference
		No current or unexpected unmet demand that would necessitate expansion to the covered pipeline		
	Efficient signalling to customers in the event of material contraction in demand - Period until 2029			No difference
		Limited relevance	Limited relevance	
Long term (post 2029)	Lower reference tariffs may enhance ability to mitigate the risk of contraction in market	Higher reference tariffs may reduce ability to mitigate contraction in market	HCA preferred	
Productive efficiency	Minimise incentives for inefficient early replacement of assets	Theoretically (and before rule mitigations) provides stronger incentives for service providers to seek inefficient early replacement of assets towards the end of their useful life	Theoretically (and before rule mitigations) provides less incentive for service providers to promote inefficient early replacement of assets towards the end of their useful life	CCA preferred in theory
		In practice the theoretical advantage of CCA is lessened because: <ul style="list-style-type: none"> The pipeline comprises a system of interdependent assets (new and old). Incentive for early asset replacement is mitigated by rule 79 of the NGR 		Benefits of CCA may not be large

Note: Orange shading indicates where one method has a benefit over the other.

288. In order to establish whether one or other of the methods achieves the NGO to the greatest degree, it is necessary to assess the trade-off between the relevant advantages and disadvantages of the two approaches as summarised in Table 3. This assessment is, in my view, complex and subtle. I set out below a qualitative assessment and then discuss the option of a more quantitative assessment.

Qualitative assessment

Allocative and dynamic efficiency in the period post 2029

289. In regard to allocative and dynamic efficiency in the period post 2029, it seems highly likely that at least part of the GGP will be operating in highly competitive downstream and upstream energy markets.

290. I understand that there have been a number of instances recently where GGT has been unsuccessful in securing the transportation of gas to mining operations, which have turned to other fuels for power generation. These include the following:

- The owners of the Parkeston Power station (Newmont and Transalta Energy) who supply electricity for gold mining operations in the Kalgoorlie area decided to cease supply from GGP and instead entered into a power purchase agreement with electricity generators supplying the South West Interconnected System and a network services agreement for transmission services with Western Power (2013).
- Sandfire Resources NL decided on a solar power station and battery storage solution to supply electricity to the DeGrussa copper and gold mine in preference to using gas supplied through the GGP (2012).
- Saracen Mineral Holdings Ltd, the owner of the Carosue Dam gold mine decided to adopt a dual diesel/gas firing solution including LNG transported by road as its principal fuel in preference to supply of gas through the GGP(2014).
- Sirius Resources the operator of the new Nova nickel and copper mine in the Fraser Range decided on a 20 MW diesel power station, and a 6.7MW solar farm in preference to supply of gas through the GGP (2015).

291. I am aware that over the relevant period the cost of solar and battery technologies are expected to continue to fall significantly. These technologies are particularly appropriate for supply of electricity to remote high cost mining operations.⁵⁰

292. It is reasonable to conclude therefore that:

- It is likely that in the period post 2029 that parts of the markets for supply of energy to mining and other customers operations within which GGT competes, will be competitive; and

⁵⁰ Clean Energy Finance Corporation, *Remote WA miner uses solar storage to reduce diesel use*, Fact Sheet July 2015

- The ability for GGT to set lower reference tariffs in the period post 2029 from adopting the HCA approach would:
 - improve to some extent its ability to mitigate the risk of contraction in demand for GGP services and thereby improve prospects for maximising pipeline utilisation; and
 - increase to some extent the competitiveness of upstream and downstream energy markets which would promote the long term interest of consumers in the area served by the GGT .

Productive efficiency

293. I have not undertaken a detailed assessment of the extent to which adopting the CCA method would minimise incentives for inefficient early replacement of assets. My qualitative judgment however is that this benefit would likely be small given the effective processes available to the ERA to review capital expenditure under rule 79 of the NGR.

Cash flow impacts

294. As noted in section 6.4, currently there may be some element of doubt about the effect of changes in short term cash flows from adopting CCA in terms of its effect on incentives to invest.

Quantitative assessment?

295. Quantification of the degree to which lower reference tariffs under the HCA approach may enhance the ability to mitigate the risk of long term contraction in demand for gas pipeline services post 2029 would, inter alia require expert knowledge of the long term dynamics of both the Western Australian mining industry and energy supply markets. It would also require complex analysis of the benefits of risk mitigation produced by differences in reference tariffs under the two methods. Both areas of analysis would require judgments about the future, which is inherently uncertain. Such analysis is beyond my area of expertise.

296. As noted I have not attempted to quantify the extent to which adopting the CCA method would minimise incentives for inefficient early replacement of assets.

Conclusion

297. Taking into account the above qualitative assessment and the qualifications noted above, I conclude that:



- it is possible the HCA method may contribute to the achievement of the NGO to the greatest degree, but I am not able to be confident of this conclusion
- it seems less likely that adopting the CCA method would contribute to the achievement of the NGO to the greatest degree
- is also possible that there is no reliable evidence that indicates a material difference between the two approaches in terms of their ability to contribute to the achievement of the NGO to the greatest degree.

7. Question 6: The cost allocation method

298. Cost allocation for the purpose of reference tariff determination must be undertaken in accordance with Rule 93 of the NGR and must comply with the NGO and RPP.
299. GGT proposed to base reference tariffs on stand-alone costs. Total revenue would be calculated as the sum of all costs associated with the services that are provided by covered assets, excluding incremental capital and operating costs associated with the services that are provided by uncovered assets.
300. The ERA did not accept the GGT proposal and instead required that for the purposes of determining the reference tariff, that joint costs should be allocated between covered and uncovered services based on relative capacity utilisation.
301. This section sets out my response to Question 6:

In relation to the methodology for calculation and allocation of total revenue for the Covered Pipeline:

- a) would the adoption of GGT's proposal contribute to the achievement of the NGO?*
- b) would changing to the ERA method contribute to the achievement of the NGO?*
- c) if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?*

7.1 Considerations

302. Rule 93 of the NGR (Allocation of total costs and revenues) is as follows:
- (1) Total revenue is to be allocated between reference and other services in the ratio in which costs are allocated between reference and other services.*
 - (2) Costs are to be allocated between reference and other services as follows:*
 - (a) costs directly attributable to reference services are to be allocated to those services; and*
 - (b) costs directly attributable to pipeline services that are not reference services are to be allocated to those services; and*
 - (c) other costs are to be allocated between reference and other services on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the AER [Authority].*
303. I understand there is agreement between ERA and GGT that the objective for developing a regulatory policy on cost allocation is to promote efficient

outcomes across all services provided by the GGP in its entirety. The ERA states:

To ensure that the total revenue allocation to covered services facilitates a reference tariff determination that reflects the efficient cost of covered services – as required by the RPP, which then ensures consistency with the NGO – the Authority determines that the CAM that allocates joint costs to covered services must seek to minimise the allocative, productive and dynamic inefficiencies across all services provided by the GGP in its entirety. It follows then that the CAM should take into account any efficiency trade-offs between covered and uncovered services.⁵¹

304. As discussed in section 2.6 a question arose as to whether or not there may be a tension in the NGO between the requirement to promote economic efficiency and the requirement to promote the long term interest of consumers. As discussed previously, in my opinion there is no such tension. While the NGL provides no explicit limitation on regulatory decisions that have the effect of transferring economic rent earned by a service provider from provision of unregulated services to consumers of regulated services, this is subject to the overarching NGO requirement to promote economic efficiency for the long term interests of consumers.
305. Therefore, in my opinion the fundamental issue in answering the above questions is to clearly define the conditions in which a cost allocation method would, or would not promote economic efficiency, and if both methods would promote economic efficiency which would promote economic efficiency for the long term interest of consumers to the greatest degree.

7.2 Question 6(a) The GGT cost allocation method

306. As noted GGT proposed to base reference tariffs on stand-alone costs. In effect this means that customers of the covered pipeline would continue to be allocated 100% of the cost of the pipeline, even though new customers may be using the pipeline. Specifically, the GGT proposal is as follows:

Total revenue is the total of the costs of offering to provide, and providing, the reference service, the negotiated services and services to the joint venturers using the Covered Pipeline excluding:

- (a) the capital costs of those parts of the pipeline system (a second compressor at Paraburdoo, in 2006, and compressors installed at Wyloo West and Ned's Creek in 2009) which are uncovered;*
- (b) the capital costs of the recent expansion for Rio Tinto Iron Ore and for BHP Billiton Iron Ore, pipeline expansion which GGT has elected be uncovered*

⁵¹ Paragraph 1486, Draft Decision ERA

and in respect of which the ERA gave its consent to GGT's election on 30 May 2014; and

- (c) the costs of operating and maintaining those parts of the GGP which are uncovered, and the costs of operating and maintaining the expansion for Rio Tinto Iron Ore and BHP Billiton Iron Ore.⁵²

307. This sub section sets out my response to question 6(a):

Would the adoption of GGT's proposal contribute to the achievement of the NGO?

Finding - the GGT proposal will promote allocative economic efficiency and therefore contribute to the achievement of the NGO

308. I consider that GGT's proposal will promote allocative economic efficiency and therefore contribute to the achievement of the NGO for the reasons summarised below. These reasons draw on detailed analysis undertaken by Mr Houston⁵³ and Dr Hird⁵⁴ which are summarised in the Draft Decision.⁵⁵

Allocative efficiency for uncovered pipeline services

309. The proposal provides GGT with the flexibility to charge prices for services on uncovered capacity that reflect marginal or incremental costs. The ability to provide users with uncovered expansions at incremental cost will promote the efficient use of, and investment in, the GGT since it:

- ensures that GGP's willingness to supply new uncovered services is not distorted by previously incurred sunk common costs
- ensures that investments will not be abandoned simply because of the inclusion of a share of non-marginal sunk common costs
- avoids the situation in which customers inefficiently reduce their use of the pipeline because of the inclusion of non-marginal sunk costs; and
- enables GGT to signal the marginal costs of the new investment to the prospective users.

⁵² Para 1364 Draft Decision

⁵³ GGT Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp *Methodology for Allocating GGP Costs*, 15 August 2014

⁵⁴ GGT Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists *Group Cost Allocation for the GGP*, 15 August 2014

⁵⁵ Paragraphs 1371 to 1386 ERA, Draft Decision

Allocative efficiency for covered pipeline services

310. The proposal promotes allocative efficiency for covered pipeline services because it ensures that the resulting reference tariff for the covered pipeline would:
- at the lower bound, provide sufficient revenue to recover the costs of providing reference services
 - at the upper bound, not exceed the efficient, standalone costs of providing those services.

Allocative efficiency for covered pipeline services is supported by prudent discount rule

311. If a customer (or customers) of the covered pipeline was unable to pay a reference tariff that includes their share of standalone cost, and this could result in reduced utilisation of the covered capacity, then GGT may be able to provide a discount under rule 96 of the NGR (Prudent discount rule).^{56 57}

Allocative efficiency for covered pipeline services is supported by capital redundancy rule

312. As noted in section 4.2.1, rule 85 of the NGR provides that a capital redundancy mechanism could be included by the ERA in a future access arrangement that would apply if customer (or customers) of the covered pipeline was unable to pay a reference tariff with the effect that that certain assets ceased to contribute in any way to deliver of pipeline services.
313. Depending on decisions about the sharing of costs associated with a decline in demand for pipeline services between the service provider and consumers, this rule may provide an incentive for GGT to adjust prices to avoid removal of an asset from the capital base. GGT would have an incentive to apply the prudent discount rule. Even if the prudent discount rule was not able to be applied it could potentially choose to negotiate a tariff to share in some of commercial pressures faced by the customer, so as to mitigate the threat of future capital redundancy.

⁵⁶ Paragraph 23 to 28, Report prepared for Gilbert+Tobin on behalf of GGT, Competition Economics Group, Cost Allocation Methodology for GGP, January 2016

⁵⁷ The ability for GGT to apply the prudent discount rule addresses a concern raised by Mr Balchin that that setting reference tariffs in excess of marginal cost could dissuade utilisation of covered services and, hence, be a source of inefficiency for investment in the covered capacity of the GGP. Paragraph 1418 DD

Finding – the criticism that the GGT proposal results in unfair subsidies is incorrect

314. The ERA notes BHPB’s submission that the cost allocation methodology adopted under rule 93 of the NGR should ensure that users are treated fairly. Specifically, BHPB states that:

A fair allocation of costs should allocate costs incurred jointly in providing both covered and uncovered services so as to avoid one group of users unfairly subsidising another group of users.

315. In my opinion BHPB adopts an incorrect definition of the term ‘subsidy’. As discussed in section 6.1.5 above, pricing theory states that prices are ‘subsidy free’ as long as they are no greater than stand alone costs and no less than incremental cost.

316. A subsidy would only arise if prices for uncovered pipeline services were set at less than incremental cost, and/or reference tariffs for covered services were set in excess of stand alone cost. I understand this is not the case under the GGT proposal.

317. The more general point is that workably competitive markets do not necessarily produce an even allocation of joint costs between different classes of users, as proposed by BHPP.

7.3 Question 6(b) Changing to the ERA cost allocation method

318. The ERA proposes that reference tariffs should be based on joint costs being allocated between covered and uncovered services based on relative capacity utilisation.

319. This section sets out my response to question 6(b)

Would changing to the ERA method (for cost allocation) contribute to the achievement of the NGO?

Finding – Changing to the ERA method would not contribute to the achievement of the NGO

320. I consider that changing to the ERA method will not promote allocative economic efficiency and therefore does not contribute to the achievement of the NGO. The reasons are outlined below.

Allocative inefficiency for uncovered pipeline services

321. The method proposed by the ERA limits GGT’s flexibility to charge prices for services on uncovered capacity that reflect marginal costs. The inability to

provide users with uncovered expansions at incremental cost may limit the efficient use of, and investment in, the GGT since it may:

- limit GGT's willingness to supply new uncovered services because of the need to recover previously incurred sunk common costs
- may cause investments to be abandoned because of the inclusion of a share of non-marginal sunk common costs
- may create a situation in which customers inefficiently reduce their use of the pipeline because of the inclusion of non-marginal sunk costs; and
- prevents GGT's ability to signal the marginal costs of the new investment to the prospective users.

322. These outcomes would be inefficient and deleterious to the achievement of the NGO.

The ERA concerns can be addressed by existing rule provisions

323. The ERA was concerned that there is a risk that the reference tariff determination for AA3 could be too high to be consistent with economically efficient outcomes as broadly defined:

if the allocation of all joint costs to covered services results in a reference tariff that exceeds the efficient cost of covered services, then there is a risk that the use of covered services could be dissuaded and that existing covered capacity could become, and remain, idle. This could be the case, if existing and potential users withdraw their demand for covered services by substituting towards services provided by the uncovered capacity of the GGP and other fuels, scaling back operations, or relocating.⁵⁸

324. I have not examined whether or not the risks of a decline in utilisation of the covered pipeline is realistic or not, but I consider that such an analysis is not necessary.

325. As noted in section 7.2 above, if a customer (or customers) of the covered pipeline was unable to pay a reference tariff that includes their share of standalone cost, then GGT can:

- seek to provide a discount under rule 96 of the NGR; and /or
- negotiate a lower tariff to mitigate the risk of future capital redundancy

326. The ERA has not taken either of these mechanisms into account in its reasoning.

⁵⁸ Para 1488, Draft Decision

GGT is better placed to make decisions on managing the risk of decline in utilisation of the covered pipeline.

327. If there was a risk that reference tariffs were too high and the use of covered services could be dissuaded and existing covered capacity become underutilised, then it is my opinion that the GGT is better placed than is the ERA to manage this risk based on the situation and facts at the time.
328. In my opinion there are likely to be commercial solutions that could be adopted by GGT in the event of a risk of pipeline underutilisation emerging, with these being able to be designed and negotiated based on the specific situation at the time. As noted these solutions include seeking to apply prudent discounts
329. Allowing GGT to commercially manage underutilisation risk, if it were to emerge, would be likely to produce more efficient solutions (and therefore be in the long term interest of all customers) than a centrally determined decision by the ERA to allocate joint costs in a particular manner in advance, necessarily without all the relevant information.

7.4 Question 6(c) Which method contribute to the achievement of the NGO to the greatest degree?

330. This section sets out my repose to Question 6(c)

if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?

331. As I consider that changing to the ERA approach does not contribute to the achievement of the NGO, there is no need to consider which method would contribute to the achievement of the NGO to the greatest degree.

8. Declaration

332. In accordance with the CM7 Guidelines I confirm that I have made all inquiries that I believe desirable and appropriate and that no matter of significance that I regard as relevant have to my knowledge been withheld from the Court.



Geoffrey Swier

26 February 2016

Attachment A - Geoff Swier, Curriculum Vitae

Geoff Swier is an economist with extensive practical experience of regulation, operation and reform, and of the electricity, electricity, water and transport industries. He has 20 years' experience in the application of economic regulation to network businesses, having acted as a policy maker, adviser, regulator and consultant to regulators and network businesses across the electricity, electricity and other infrastructure sectors in Australia and New Zealand. He has acted as an expert in dispute resolution, advisory panels and arbitrations. He has also had significant experience as a board director of energy companies.

Currently he is a director of Farrier Swier Consulting (FSC) and independent non-executive director of Trustpower (NZ). Previous roles include: member of the Australian Energy Regulator (2005-08), director of VENCORP (1999-2001), Victorian representative on the National Grid Management Council (1995); policy director for a board established by the New Zealand government to oversee the reform of the New Zealand public hospital system (1992-93), and economic adviser to the New Zealand Minister of State Owned Enterprises (1990) and New Zealand Minister of Finance (1984-87).

Since forming Farrier Swier Consulting in 1999, Geoff's experience and expertise has included:

- appearing as an expert witness and membership of dispute resolution panels in energy sector legal proceedings
- designing, implementing and advising on regulatory regimes and market development
- applying the principles of regulation, government accountability and corporate governance to policy development
- reforming international energy markets through World Bank and Asian Development Bank projects in Indonesia, Philippines, China, and South Africa.

Qualifications

Masters of Commerce Degree in Economics, University of Auckland 1981.

Experience as Expert Witness

- Expert report on economic considerations for the interpretation of the NGO, prepared for Jemena Gas Networks (Vic) (2015)
- Expert report for the Financial Investors Group for submission to a review on the limited merits review regime being undertaken by the Standing Council on Energy and Resources (2012)
- Expert report for the Energy Networks Association assessing rule changes proposed by the Australian Energy Regulator in relation to regulatory process and practices for energy network regulation (2012)
- Expert report for Jemena Electricity Networks (NSW) on the regulatory treatment of operating expenditure by the AER (2010)
- Expert report for Jemena Electricity Networks (NSW) on the appropriate classification of the NSW electricity networks (2009)
- Expert witness in arbitration of a dispute under a power purchase agreement. Matters covered in the witness statement included an explanation of how market prices are determined in the electricity market, and a summary of generation investment and market issues that affect the electricity market (2000)
- Assisted in the preparation of an expert witness statement in an arbitration of a dispute under a Long term Electricity Supply Agreement. Matters covered included the effect of the implementation of the national electricity market on future electricity prices (1997).

Expert Panels, Dispute Resolution

- Chair, Evaluation Review Panel, Non-binding expert evaluation: Public Lighting Dispute in South Australia (National Electricity Rules, 2015)
- Member, Dispute Resolution Panel (DRP), scheduling errors, renewable energy certificate claim (National Electricity Rules, December, 2012)
- Sole DRP Member, determination of claim for recovery from participant compensation fund for a scheduling error affecting dispatch of Mintaro Electricity Turbine Station (National Electricity Rules, 2010)
- Chair, expert panel established to advise the AEMC on an application for compensation by Synergen under the National Electricity Rules (2010)
- DRP Member - TruEnergy vs. Vencorp and others (Victorian National Electricity Market, 2009)
- DRP Member - Powercor vs. Vencorp re. Wemen (National Electricity Rules, 2009, settled)
- Member AEMC advisory panel for establishment of first compensation guidelines, February, 2009

- Member three person expert panel providing advice to the Ministerial Council of Energy on definitional matters for the National Electricity Law (2005); Client Commonwealth Treasury

Selected relevant consultancy experience

Energy Network price submissions

- Adviser and member of SP AusNet Steering Committee: 2016 Electricity Distribution Price Review Price (2014)
- Adviser and member of Ausgrid EDPR Steering Committee: 2014 Electricity Distribution Price Review Price (2013)
- Adviser and member of SP AusNet Steering Committee: 2014 Electricity Access Arrangement Review (2011- 2012)
- Adviser and member of SP AusNet Steering Committee: 2010 Electricity Distribution Price Review (2009-2010)
- Adviser and member of TXU Networks Steering Committee: 2005 network price determination (2004)
- Adviser to Integral Energy in relation to preparation of its submission for the 2004 network price determination (2002-03).

Economic Regulation

- Advisor to the New Zealand Commerce Commission on the development of Input Methodologies for capital and operating expenditure forecast information in proposals by a regulated supplier for a customised price-quality path (2009)
- Advice to National Transport Commission on application of economic regulation concepts to road pricing reform (2006)
- Provided advice to the Independent Pricing and Regulatory Tribunal (IPART) on its Investigation into Water and Wastewater Service Provision in the Greater Sydney Region (2005)
- Preparation of revised Electricity Transmission Rules (Part F) for the New Zealand Electricity Market. Developed detailed drafted Transmission rules based on policy framework developed by the Ministry of Economic Development managed consultation with stakeholders and prepared final rules (2003)
- Prepared study for the Australian Utility Regulators Forum on comparing Indexed Approaches with Building Blocks (2002)
- Economic and regulatory advice to Sydney Water (2003).

Industry Reform

- Key adviser in Victorian and Australian national electricity and electricity reform (1994-1999)
- Review of Indonesia Power Sector Reform Strategy, Asian Development Bank (2009)
- Prepared a report for the Victoria Competition and Efficiency Commission to review relevant experience and the state of play and thinking on promoting greater competition and urban water markets as input to the Commissions Inquiry into Reform of the Metropolitan Retail Water Sector (2007)
- Advice to Water Corporation (Western Australia) on options for industry structure and enhancing private sector participation and competition (2006)
- Advice to the Independent Pricing and Regulatory Tribunal (IPART) on its investigation into the structure of the greater metropolitan Sydney water industry (2005)
- Appointed to an expert panel (Energy System Review Committee - Singapore) to provide advice to the Minister of Energy on energy security and reliability of the Singapore electricity and electricity systems following a major incident at a electricity receiving facility (2004)
- Member of team undertaking major review of the New Zealand Electricity Market for NZ Ministry of Economic Development (2003)
- Technical assistance study to the Peoples Republic of China for the establishment of the State Electricity Regulatory Commission. Asian Development Bank (2003).

Prizes/Awards

- International Fellow of the Kings Fund, a charitable organisation based in London, which provides management and organisational development advice to the health sector in the United Kingdom and elsewhere
- Caughey Scholarship, Kings College, Auckland NZ.

Employment History

July 2015 -present	Technical Advisory Panel, Australian Renewable Energy Agency
July 2014 - present	Director, Health Purchasing Victoria

January 2008 - present	Director, Trustpower (NZ), chair audit committee
July 2005 - June 2008 January 2007	Part Time Member, Australian Energy Regulator, Associate Commissioner of the Australian Competition and Consumer Commission
1999 to 2001	Director, Victorian Energy Networks Corporation
July 1999 - present	Director and owner, Farrier Swier Consulting Pty Ltd
September 1993 to June 1999	Department of Treasury and Finance, (Victoria) <ul style="list-style-type: none"> • Deputy Project Leader, Electricity Supply Industry Reform Unit (1994 - June 1996) • Deputy Project Leader, Energy Projects Division (July 1996- June 1999) • Victorian representative, National Grid Management Council Government observer • Board of Directors, Victorian Power Exchange, • Board of Directors, Victorian Energy Networks Corporation • Citipower • Ecogen
1992 - August 1993	Health Reforms. Director (Economic and Financial Policy), National Interim Provider Board (NZ)
1991-	Economic and Financial Consulting (NZ) <ul style="list-style-type: none"> • Trans Power (Commercial and pricing issues connected with separation from ECNZ; Governance and ownership issues, Wholesale Market Development) • Airways Corporation • Australia Post
1990	Adviser, Office of State Owned Enterprises (NZ)
1988 - 1989	Senior Management Consultant, Ernst & Young, Energy Sector Consulting Group (NZ)
October 1987 - 1988	Associate Director, Investment Banking, DFC New Zealand (NZ)
June 1984 - October 1987	Economic Advisor, Office of the Minister of Finance (NZ)
May 1983 - June 1984	Economist, Labour Party Parliamentary Research Unit (NZ)
1982 - May 1983	Policy Officer, Forecasting and Planning Division, Ministry of Energy (NZ)



Attachment B - Scope of work

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15 February 2016

By email

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Confidential and privileged

Dear Mr Swier

Goldfields Gas Pipeline Access Arrangement Review - ERA draft decision

We act for Goldfields Gas Transmission Pty Ltd (**GGT**), the operator of the Goldfields Gas Pipeline (**GGP**). We are currently advising GGT in relation to the access arrangement review for the GGP being conducted by the Economic Regulation Authority (**ERA**).

Background on the GGP

The GGP was constructed in the 1990s to deliver natural gas from offshore gas fields in the north west of Western Australia to inland mining regions.

The GGP (as constructed) became a “covered pipeline” under section 1.1 of the Gas Code from the date of commencement of the code. The Gas Code described the covered pipeline by reference its route, length and diameter at the time.¹ On the commencement of the National Gas Law (**NGL**), the GGP, insofar as it was a covered pipeline under the Gas Code, was deemed to be a covered pipeline under the NGL.²

When the pipeline was completed in 1996 it incorporated two compressor stations. A further compressor was installed in 2000 – 2001 at Wiluna and another at Paraburdoo in 2003 - 2004. The capacity served by these four compressors (a total of 109 TJ / day) was treated as entirely covered capacity.

However subsequent expansions of capacity have been treated as uncovered, pursuant to the Extensions/Expansions Policy in the relevant access arrangements that applied to the GGP when the expansions were undertaken. The relevant expansions that are uncovered are:

- installation of additional compressors at Paraburdoo (second compressor) in 2006, Wyloo West in 2009 and Ned’s Creek in 2009. As a result of the installation of these three compressors, the pipeline was able to transport an additional 49 TJ / day of gas. GGT elected to treat the

¹ Gas Code, Schedule A.

² NGL, Schedule 3, Item 6.

capacity created by these expansions as uncovered capacity, as it was entitled to do under the access arrangement in place at that time;³ and

- an expansion of capacity in the Pilbara region, including installation of four compressor units at existing compressor station sites in Yarraloola and Paraburdoo, and construction of a new compressor station at Turee Creek, between Paraburdoo and Newman. This expansion added approximately 43.3 TJ / day of capacity. GGT obtained approval from the ERA to treat the capacity created by this expansion as uncovered capacity, as it is required to do under the current access arrangement.⁴

Therefore, the GGP now includes both a covered component and an uncovered component. The covered component is the pipeline as it was prior to the 2006 and subsequent expansions (referred to below as the **Covered Pipeline**). The Covered Pipeline has capacity of approximately 102.5 TJ/day and this capacity is forecast to be almost fully contracted at least for the duration of the forthcoming access arrangement period. The additional capacity that was added through the 2006 and subsequent expansions is uncovered.

In the scheme of the NGL and the National Gas Rules (**NGR**), it is the Covered Pipeline that is subject to economic regulation. Regulatory approval for an access arrangement is only required in respect of covered pipelines.⁵

In August 2014, GGT submitted its access arrangement revision proposal for the Covered Pipeline to the ERA. This access arrangement revision proposal was made in respect of the period 1 January 2015 to 31 December 2019.

On 17 December 2015, the ERA released its draft decision not to approve GGT's access arrangement proposal for the 2015-2019 period (**Draft Decision**). The Draft Decision required GGT to submit a revised access arrangement revision proposal to the ERA by 29 January 2016. In the Draft Decision, the ERA indicated that revisions to the access arrangement are anticipated to commence on 1 July 2016. Therefore the revised access arrangement revision proposal has been made in respect of the period 1 July 2016 to 31 December 2019.

On 29 January 2016, GGT submitted its revised access arrangement revisions proposal and initial response to the Draft Decision (**Initial Response to the Draft Decision**). GGT and other stakeholders have an opportunity to make further submissions in response to the Draft Decision by 26 February 2016.

ERA draft decision on depreciation

One of the elements of GGT's access arrangement revision proposal which was not approved in the Draft Decision is the proposed regulatory depreciation allowance (the regulatory depreciation allowance being an input into the determination of reference tariffs for the forthcoming access arrangement period).

³ Goldfields Gas Pipeline Approved Access Arrangement (as approved by the ERA on 14 July 2005 and revised on 17 December 2008), clause 10.3.

⁴ ERA, *Notice - Application for expansion of the Goldfields Gas Pipeline to be not regulated: Determination*, 30 May 2014; ERA, *Goldfields Gas Transmission's Proposed Expansion of the Goldfields Gas Pipeline: Issues Paper*, 27 March 2014.

⁵ NGR, rule 46.

As part of its access arrangement proposal, GGT proposed to calculate the regulatory depreciation allowance by reference to unindexed asset values (also referred to as the historic cost accounting (**HCA**) method). This is consistent with how the regulatory depreciation allowance had been calculated in prior access arrangement periods for the GGP. GGT's proposal was supported by an expert report from HoustonKemp.

In the Draft Decision, the ERA did not accept GGT's proposed method for calculating the regulatory depreciation allowance, on the basis that the proposed approach did not satisfy the relevant requirements of the NGR. The ERA considers that GGT's proposed forecast depreciation approach does not meet the requirement in rule 89(1)(a) of the NGR, which is that the depreciation schedule should be designed so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services. The ERA considers that GGT's proposed approach, by "dragging forward depreciation", distorts tariffs through time, thereby introducing the clear risk of inefficient growth in the market for reference services (Draft Decision, paragraph 1222). The ERA also considers that GGT's proposed approach does not comply with the national gas objective (**NGO**) and certain of the revenue and pricing principles (**RPP**).

The Draft Decision required that GGT change from the HCA method to a current cost accounting (**CCA**) method forthwith.

The Draft Decision notes that changing from an HCA method to the CCA method will result in a significant reduction in revenue and reference tariffs for the forthcoming access arrangement period. The ERA estimates that the change from HCA to CCA will reduce total revenue over the forthcoming period by approximately \$30 million, or 15 per cent (Draft Decision, paragraph 1266).

In its Initial Response to the Draft Decision, GGT did not change its depreciation methodology. GGT maintained the HCA method, on the basis that this method complies with applicable legal requirements and is consistent with the depreciation criteria set out in rule 89(1) of the NGR. GGT submitted a further expert report from HoustonKemp in support of its position.

ERA draft decision on cost allocation

Another element of GGT's access arrangement revision proposal which was not approved in the Draft Decision is the proposed method for calculation and / or allocation of total revenue for the Covered Pipeline.

As part of its access arrangement revision proposal, GGT proposed to calculate total revenue for the purposes of determining reference tariffs as the total cost of providing pipeline services using the Covered Pipeline. Thus, under GGT's proposal, total revenue includes all costs associated with the provision of services using the Covered Pipeline, and excludes incremental capital and operating costs associated with uncovered assets. Reference tariffs are then calculated on an assumption that 100% of the capacity of the Covered Pipeline provides reference services, and the total revenue amount is allocated to reference services. As such the reference tariff represents the standalone cost of providing reference services.

In the Draft Decision, the ERA did not accept GGT's proposed method for allocating costs (and therefore total revenue). The ERA determined in the Draft Decision that only a share of 'joint costs' should be allocated to services provided by means of the Covered Pipeline. Under the ERA's approach, total revenue for the purposes of determining reference tariffs would be less than the total cost of providing pipeline services using the Covered Pipeline, since a share of joint costs incurred in providing these services would be allocated away.

In the Draft Decision, the ERA refers to expert reports from HoustonKemp and CEG that were submitted by GGT in relation to this issue, and an expert report from Incenta that was submitted by BHP Billiton.

Although it is not clear from the Draft Decision, the ERA appears to conclude that:

- a reference tariff determination based on a total revenue amount that includes all of the costs that are directly attributable to the provision of services provided by means of a covered pipeline as well as the joint costs that are incurred in the provision of all services (including services provided by means of uncovered capacity),
- without any adjustment to allocate some of those joint costs away from reference services,
- would be an unacceptable outcome.⁶

That is, the ERA appears to conclude that a reference tariff determination that is based on the standalone costs of providing services by means of a covered pipeline, is inconsistent with the NGO.

Specifically in the context of the GGP, the ERA finds that the total revenue allocation proposed by GGT, gives rise to a “risk that the reference tariff determination for AA3 could be too high to be consistent with economically efficient outcomes as broadly defined”.⁷ The ERA considers that a consequence of a reference tariff calculated in the manner proposed by GGT would create a risk that the “use of covered services could be dissuaded and that existing covered capacity could become, and remain, idle”.⁸ In light of the ERA’s finding that there is a risk of covered capacity becoming and remaining idle over the life of the forthcoming access arrangement period, the ERA determines that only a share of the joint costs should be allocated to covered services:⁹

...in order to ensure that the reference tariff more closely reflects the efficient cost of those services, consistent with the RPP [revenue and pricing principles] and the achievement of the NGO [national gas objective].

The ERA concludes that a total revenue allocation to covered services that allocates joint costs across all services provided by the GGP will “minimise the burden of economic inefficiencies across all services provided by the GGP in its entirety”, particularly when compared to the “burden of economic inefficiencies” the ERA considers arise from GGT’s proposed approach.¹⁰

The ERA’s decision on cost allocation has a significant impact on total revenue for the Covered Pipeline and reference tariffs. Under the ERA’s proposed approach, total revenue allocated to the Covered Pipeline is approximately \$49 million (19 per cent) lower, compared to total revenue under GGT’s proposed approach, holding all other elements of the Draft Decision constant.¹¹

In its Initial Response to the Draft Decision, GGT did not revise its methodology for calculation and allocation of total revenue for the Covered Pipeline. GGT continued to calculate total revenue for the

⁶ Draft Decision, [1466]-[1468].

⁷ Draft Decision, [1487].

⁸ Draft Decision, [1488].

⁹ Draft Decision, [1491].

¹⁰ Draft Decision, [1493].

¹¹ This is calculated as the difference between the ERA-approved total revenue for each year (Table 4 of the Draft Decision) and total revenue allocated to reference services for each year (Table 99 of the Draft Decision).

purposes of determining reference tariffs as the total cost of providing pipeline services using the Covered Pipeline, and continued to allocate this quantum of total revenue to services provided by means of the Covered Pipeline. GGT submitted a further expert report from CEG in support of its position.

Decision-making framework

Price and revenue regulation of covered pipeline service providers is governed by Part 9 of the NGR.

Under the NGL (section 28), the ERA must, in performing or exercising any of its economic regulatory functions or powers, perform or exercise those functions or powers in a manner that will or is likely to contribute to the achievement of the NGO. Further, in making certain regulatory decisions (including decisions on whether to approve an access arrangement), if there are two or more possible decisions that will or are likely to contribute to the achievement of the NGO, the ERA must make the decision that the ERA is satisfied will or is likely to contribute to the achievement of the NGO to the greatest degree.

The NGO is:

“...to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.”

The ERA must also take into account the revenue pricing principles (section 24 of the NGL) when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff.

In this context, GGT is seeking an expert report on economic considerations relating to the interpretation and application of the NGO, including as it applies to the ERA’s Draft Decision on the depreciation and cost allocation issues described above.

Scope of work

We are seeking a report from you, setting out your expert opinion in relation to the following matters:

- 1 As an expert economist, do you have a particular understanding of the NGO and, if so, what is your understanding of the NGO?
- 2 How should an economic regulation regime be designed to promote the NGO – that is, what features should the economic regulation regime have so that decisions on price and revenue regulation will contribute to the achievement of the NGO?
- 3 Pursuant to the NGR, the total revenue a service provider is permitted to earn from reference services in each regulatory year of an access arrangement period is determined as the sum of the following building blocks (**building blocks framework**):
 - (a) a return on the projected capital base for the year
 - (b) depreciation on the projected capital base for the year
 - (c) the estimated cost of corporate income tax for the year

- (d) increments and decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency; and
- (e) a forecast of operating expenditure.

In your view, is the application of the building blocks framework likely or not to contribute to the achievement of the NGO and, if so, how?

- 4 If there is a material error in the application of the building blocks framework (i.e. an error in estimation of a component of the building blocks):
 - (a) is the outcome likely or not to contribute to the achievement of the NGO?
 - (b) what is the nature or type of consequences that may arise in such circumstances?
 - (c) are these consequences, or the risks associated with such consequences, likely to be different depending on the nature, magnitude or direction of the error?

- 5 In relation the depreciation schedule to be applied in determining reference tariffs for the Covered Pipeline:
 - (a) is GGT's proposal to continue use of the HCA method consistent with the depreciation criteria set out in rule 89(1) of the NGR?
 - (b) would the adoption of GGT's proposal contribute to the achievement of the NGO?
 - (c) would changing to a CCA method (as proposed by the ERA) contribute to the achievement of the NGO?
 - (d) if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?

- 6 In relation the methodology for calculation and allocation of total revenue for the Covered Pipeline:
 - (a) would the adoption of GGT's proposal contribute to the achievement of the NGO?
 - (b) would changing to the ERA method contribute to the achievement of the NGO?
 - (c) if you consider that adoption of either approach would contribute to the achievement of the NGO, which would contribute to the achievement of the NGO to the greatest degree?

Your responses to each of the above questions should be based on your expertise as an economist, the information contained in the Draft Decision and GGT's access arrangement proposal, and the additional information provided by us.

Information to be provided by us

Copies of the GGT access arrangement proposal, Initial Response to the Draft Decision (including the supporting expert reports), the NGL and the NGR are publicly available. However if you would like us to provide copies of these documents, please let us know.

We will provide you with a confidential version of the Draft Decision.

To the extent that you require further information from us or GGT, please contact us and we will endeavour to provide this.

Guidelines for preparing your report

The Guidelines for Expert Witness in the Federal Court of Australia are attached to this letter. GGT is seeking a rigorously prepared independent view which may be used in the context of regulatory decision making and in any subsequent review of the ERA's final decision. Therefore you are requested to follow the Guidelines to the extent reasonably possible.

In particular, as part of any report please:


- (a) identify your relevant area of expertise and provide a curriculum vitae setting out the details of that expertise;
- (b) only address matters that are within your expertise;
- (c) where you have used factual or data inputs please identify those inputs and the sources;
- (d) if you make assumptions, please identify them as such and confirm that they are in your opinion reasonable assumptions to make;
- (e) if you undertake empirical work, please identify and explain the methods used by you in a manner that is accessible to a person not expert in your field;
- (f) confirm that you have made all the inquiries that you believe are desirable and appropriate and that no matters of significance that you regard as relevant have, to your knowledge, been withheld from your report; and
- (g) please do not provide legal advocacy or argument and please do not use an argumentative tone.

Timing

We require a draft report by 19 February 2016 and a final report by 25 February 2016.

If you have any questions, please do not hesitate to contact us.

Yours sincerely



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Attachment: Federal Court guidelines for expert witnesses

Practice Note CM 7: Expert witnesses in proceedings in the Federal Court of Australia

Guidelines

1. General Duty to the Court¹²
 - 1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.
 - 1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.
 - 1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.
2. The Form of the Expert's Report¹³
 - 2.1 An expert's written report must comply with Rule 23.13 and therefore must
 - (a) be signed by the expert who prepared the report; and
 - (b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and
 - (c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and
 - (d) identify the questions that the expert was asked to address; and
 - (e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and
 - (f) set out separately from the factual findings or assumptions each of the expert's opinions; and
 - (g) set out the reasons for each of the expert's opinions; and
 - (ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above¹⁴; and
 - (h) comply with the Practice Note.
 - 2.2 At the end of the report the expert should declare that "[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the Court."

¹²The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

¹³Rule 23.13.

¹⁴See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court¹⁵.

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports¹⁶.

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

¹⁵ The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

¹⁶ The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240