NERA
ECONOMIC CONSULTING

Depreciation Options for ATCO Gas

Expert report of Gregory Houston
ATCO Gas Australia

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1. Introduction

I have been asked by Johnson Winter & Slattery (JWS) to prepare this report on behalf of ATCO Gas Australia Pty Ltd (ATCO Gas). The context for JWS's request is the forthcoming review by the Economic Regulation Authority of Western Australia (ERA) of the access arrangements for the supply of gas transportation services provided by the Mid West and South West Gas Distribution System (the gas network). The proposed access arrangements are to apply for the period from 1 July 2014 to December 2019.

The terms and conditions upon which ATCO Gas provides access to its gas transportation network are subject to five yearly review by the ERA. The review of the access arrangements for the 2014-2019 period commences on 16 March 2014, when ATCO Gas submits its proposed revisions to the access arrangements for its gas network.

1.1. Scope of this report

The subject of my report is the depreciation allowance to be applied to the calculation of the capital base in deriving the annual revenue requirement for the gas network. The annual allowance for depreciation within a gas access arrangement is determined by Division 6 of Part 9 the National Gas Rules (NGRs).

JWS has asked me to explain the economic role of certain rules that govern the terms of access arrangements under the NGR and to addresses a number of questions about those rules, which I reproduce below:

1. An explanation of the economic function of Rule 89, particularly 89(1)(a) and the related 89(2) and the relationship with Rule 94 (if any), and their relationship with the national gas objective (NGO).
2. In your opinion, and having regard to the decision of the Tribunal in APA GasNet, what does it mean for a depreciation schedule to be designed so that reference tariffs vary over time 'in a way that promotes efficient growth in the market for reference services' (Rule 89(1)(a)). How should that Rule be interpreted, from an economic expert point of view?
3. Based on your opinion on what is required to meet Rule 89(1)(a), which of the following approaches best meets the requirements of that rule:
    (a) an approach where the regulatory asset base is not indexed and straight line depreciation is applied; or
    (b) the transitional approach proposed by ATCO Gas Australia; or
    (c) the approach used by the AER and proposed by the ERA where the asset base is indexed and inflation removed from the depreciation allowance using the post-tax revenue model (PTRM).

I attach a copy of JWS's instructions as Annexure A.

1.2. Expertise

I am a director of the global firm of expert economists, NERA Economic Consulting (NERA), and head of its Australian operations, based in Sydney. Over a period of almost twenty five years I have developed substantial expertise and experience in both the principles of regulatory economics and their application. I have developed this expertise in the course of advising regulators, businesses providing services by means of regulated infrastructure assets, upstream and downstream users of those services, as well as governments on issues arising in the economic regulation of infrastructure-based services. My experience encompasses a range of policy, regulatory design and financial economics questions as well as detailed third party access and price setting matters arising in the airport, electricity, gas, ports, rail, telecommunications, water and wastewater sectors.

I have testified on these as well as competition economics matters on numerous occasions before arbitrators, appeal panels, regulators, the Federal Court of Australia, the Competition Tribunal and other judicial or adjudicatory bodies.

I hold a post-graduate, BSc (Hons) in economics from the University of Canterbury, which I was awarded with first class honours in 1983. I attach a copy of my curriculum vitae as Annexure B.

1.3. Structure of this report

My report is structured as follows:

- section 2 sets out my understanding of the context for this report, with particular attention to the role of depreciation in determining total revenue in each regulatory year;
- section 3 discuss the particular requirements of the NGRs in relation to the depreciation element of the building block approach, and the economic principles embodied therein;
- section 4 describes the concept of long run marginal cost (LRMC) and my expectations as to how the LRMC for the service provided by ATCO Gas's network is likely to vary over time;
- section 5 describes ATCO Gas's three revenue models and compares the long term price levels calculated under each model;
- section 6 presents my conclusions, by reference to the particular questions that I have been asked to address; and
- section 7 contains my declaration, as required by the Federal Court guidelines for expert witnesses.

1.4. Expert witness guidelines

I confirm that in preparing this report I have been furnished with a copy, read, understood and agree to abide by the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*".

2. Context for this Report

This section sets out my understanding of the relevant context for the determination of the depreciation element of the total revenue calculation, which in turn underpins the derivation of reference tariffs in ATCO Gas's proposed access arrangement.

2.1. Depreciation as a total revenue building block

The NGRs stipulate that the total revenue for each regulatory year of an access arrangement period is to be derived as the sum of five building blocks, ie:[1]

- a return on the projected capital base;
- depreciation on the projected capital base;
- the estimated cost of corporate income tax;
- increments and decrements resulting from the operation of incentive mechanisms; and
- a forecast of operating expenditure.

The effect of the building block approach is that, in any year, the cost of capital assets are incorporated into the total revenue calculation by means of two separate cost allowances, ie, amounts for:

- a return on the projected capital base; and
- depreciation on the projected capital base.

Further, rule 78(c) specifies that the projected capital base for a particular period shall be calculated by deducting the forecast depreciation for the period. The consequences of this interrelationship are that, all else equal, a higher depreciation allowance will:

- increase the total revenue calculation at rule 76 (and so reference tariffs) for the access arrangement period in question; and
- reduce the total revenue calculation (and so reference tariffs) in future access arrangement periods, on account of the lower projected capital base.

2.2. Effect of different depreciation methods

As a matter of principle, there are a number of alternative methods for deriving a schedule for each year's depreciation allowance so that an asset is (or group of assets are) fully depreciated at the end of its (their) economic life. Different methods for deriving an allowance for depreciation will result in different profiles for the recovery of capital over time. Two common methods for determining the annual depreciation allowance for regulated infrastructure businesses are:

[1] See rule 76 of the NGR.

- **straight line depreciation**, whereby the allowance is set in the form of annual instalments that are equal in current or prevailing price terms in each year of the asset's (or asset group's) projected economic life, without any annual indexation adjustment to the value of the capital base for the effect of inflation on the purchasing power of money – throughout the remainder of this report, I refer to this depreciation methodology as the 'straight line depreciation' approach, which is used in conjuction with an 'unindexed capital base'; and
- **indexed straight line depreciation**, whereby the allowance differs in each year, because it is derived in combination with annual indexation adjustments to the value of the capital base for the effect of inflation on the purchasing power of money so as to be equal in constant or inflation adjusted price terms. Under this approach, depreciation is calculated as the sum of:
  - the opening capital base divided by the assets' remaining economic life; *less*
  - the amount that the opening capital asset base is (or is projected to be) indexed for inflation over the same period.

  Throughout the remainder of my report, I refer to this depreciation methodology as the 'indexed straight line depreciation' approach, which is used in conjunction with an 'indexed capital base'.

Indexed straight line depreciation is the approach that has been adopted to determine the depreciation allowance for ATCO Gas in previous access arrangements approved by the ERA. By contrast, most North American regulators apply straight line depreciation.

These two depreciation methodologies result in a quite different time profile for the value of the capital base, depreciation allowance and so total revenues (and reference tariffs).

To illustrate these differences, at Figure 2.1 and Figure 2.2 I show the results of a model that calculates values in each year for the capital base, depreciation and capital related revenues (being the depreciation and return on capital elements of the building block approach referred to at rule 76) for two assets, each with an initial cost of $1 million, but differing in that:[2]

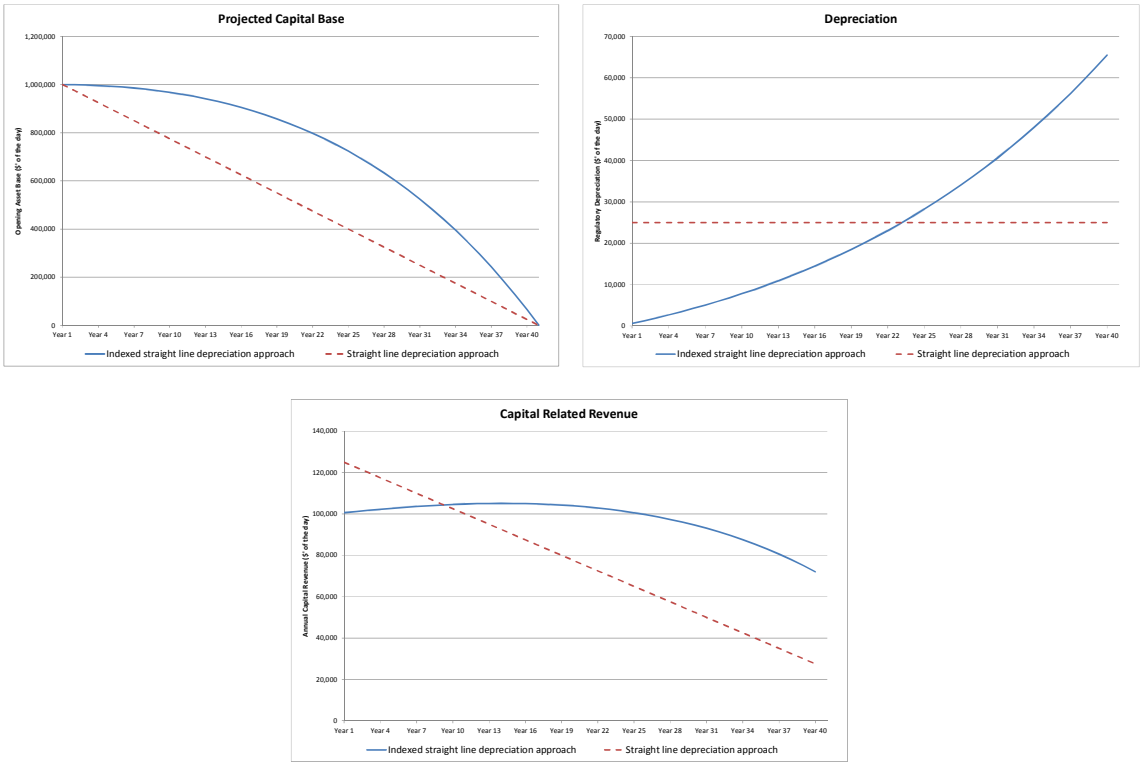
- one has an economic life of 40 years; while
- the other has an economic life of 120 years.

Figure 2.1 shows that, under the indexed straight line depreciation approach, for an asset with an economic life of 40 years the depreciation allowance (shown as a blue line) in the first year is close to zero. The depreciation allowance then increases over time such that, in the final year of the asset's life (ie, year 40) depreciation is approximately $67,000.

By contrast, under the straight line depreciation approach the annual depreciation allowance (shown as a red dotted line) for the same asset is $25,000 per year.

[2] Both figures model: an asset with an initial asset value of $1 million; an expected inflation rate of 2.5%; and a nominal cost of capital of 10%.

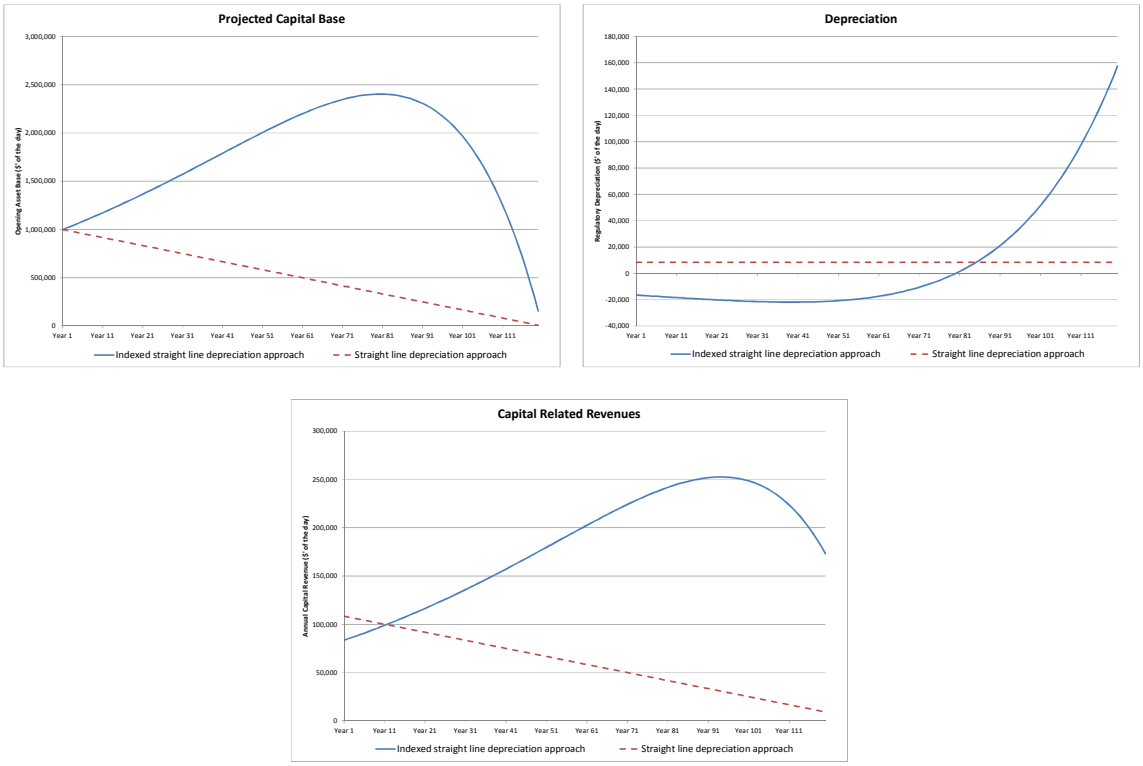
Figure 2.1
40 Year Asset



Source: NERA calculation

Figure 2.2 shows the same variables, but for an asset with an economic life of 120 years. In this example, under the indexed straight line depreciation methodology, the depreciation allowance (shown as a blue solid line) is negative for the first 80 years. Put another way, the value of the asset (or capital base) appreciates for the first 80 years before then depreciating to zero by the end of year 120. Moreover, the value of the capital base only falls below its initial value in the 114th year.

Figure 2.2
120 Year Asset



Source: NERA calculation

Figure 2.1 and Figure 2.2 illustrate – for the case of a single asset – the different effects that these two depreciation methodologies have on the total revenue that would be derived under rule 76 of the NGR.

Application of the building block approach – and particularly the steps set out in rule 76 and 78 – means that a higher depreciation allowance and so total revenues today must necessarily result in a lower depreciation allowance and total revenues in the future.

It follows that the depreciation methodology will also affect the time profile of reference tariffs or revenue per unit sold, irrespective of whether these are expressed in terms of each GJ of gas delivered, or each delivery point – such as a household customer – to which gas is transported.

Although the choice of depreciation method clearly affects the time profile of both total revenue and revenue per unit, other factors will also affect the level of revenue per unit through time. These include:

- the level of operating and maintenance costs, which can be expected to change through time;
- the quantum and timing of new capital investments;

- the mix of assets (and the different economic lives implied by that mix) used to provide the reference services;
- changes in the allowed rate of return on the capital base;
- changes in demand for reference services, which affect revenue per unit (rather than total revenue); and
- the cost of company income tax.

It follows that the long term implications of adopting one or other depreciation methodology on the revenue per unit outcome for reference tariffs is an empirical question that depends on the particular circumstances of a particular gas pipeline.

In section 5 of my report I examine the long term projections of ATCO Gas's revenue per unit under three depreciation methodologies that JWS has asked me to assess. In the following section 4, I provide an economic analysis of those provisions of the NGRs that govern the determination of the depreciation allowance.

3. Depreciation under the NGRs

In this section I discuss the particular requirements of the NGRs in relation to the depreciation element of the building block approach, with particular attention to the economic principles embodied therein, and what is required to apply them.

I also explain the nature and reasons for the inconsistencies between my interpretation of these economic principles and the analysis put forward by the Australian Energy Regulator (AER) in the context of access arrangements recently proposed by APA GasNet.[3]

3.1. Economic function of rule 89

The criteria for determining the depreciation schedule to be applied in an access arrangement are set out in rule 89 of the NGR, which states that:

(1) 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

  (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 (ie 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.

(2) Compliance with subrule (1)(a) may involve deferral of a substantial proportion of the depreciation, particularly where:

  (a) the present market for pipeline services is relatively immature; and

  (b) the reference tariffs have been calculated on the assumption of significant market growth; and

  (c) the pipeline has been designed and constructed so as to accommodate future growth in demand.

(3) The AER's discretion under this rule is limited.

The first requirement of rule 89(1) states that the depreciation schedule should be designed so that the time profile of tariffs promotes efficient growth in the market for reference services.

In my opinion, efficient growth in the market for gas pipeline services will be promoted by tariffs that reflect – at each and every point in time – the marginal cost of providing the

[3] AER, *Access arrangement draft decision APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2 Attachments*, September 2012, pages 176-181.

particular service in question. Such tariffs ensure that users are presented with a financial signal as to the resource cost of providing the service, thereby encouraging them to consume the service only when the benefit to them exceeds the cost of its provision. In economics, tariffs that reflect this principle are said to be 'allocatively efficient'.

3.2. Relationship with rule 94

The design of allocatively efficient tariffs in circumstances where capital costs previously incurred (as represented by the capital base) need to be recovered – in order to ensure that service providers will be willing to invest in future, long lived assets – is a complex challenge.

This task is provided for in rule 94 of the NGRs, which sets out a number of principles to be applied in determining the structure – as distinct from the level – of reference tariffs for distribution pipelines.

It is widely recognised in the economics literature[4] that, in the presence of such fixed costs, the most efficient means to achieve this is through the use of a two part tariff. This is reflected in the provisions in rule 94(4), which specifically provides for the design of reference tariffs that consist of two or more charging parameters. For the purpose of addressing the implications of different potential depreciation schedules for the allocative efficiency of reference tariffs, I have therefore considered the circumstance where reference tariffs are structured so as to have both a fixed and a variable element.

An allocatively efficient two part tariff should be designed so that:

- the variable tariff element (being that typically applying to the service component for which the customer has greatest ability to exercise discretion as to how much it will consume) is set as close as practicable to the long run marginal cost (LRMC) of the resources used to provide that (variable) element of service; and
- the fixed element of tariff (being that typically applying to the service component for which the customer has limited ability to exercise discretion as to how much it will consume) is set so as to recover the residual revenue requirement in that year.

These principles are reflected in the combination of:

- rule 94(4)(a), which refers to the role of long run marginal cost in setting the level for each charging parameter; and
- rule 94(5), which refers to the need to adjust tariffs in order to ensure recovery of expected revenue with minimum distortion to efficient patterns of consumption (or in other words, to ensure allocative efficiency).

Since the depreciation schedule affects only the time profile of total revenue per unit of service, as a matter of principle the choice of one or other depreciation schedule will affect outcomes for the structure of reference tariffs through either:

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[4] See, for example: Oi, Walter Y, *A Disneyland Dilemma: Two-Part Tariffs for a Mickey Mouse Monopoly*. Quarterly Journal of Economics 85 (1971), pages 77-96.

- an adjustment to the variable element, which would compromise the objective of setting it as close as practicable to LRMC; or
- an adjustment to the fixed element, which will also affect efficient patterns of consumption, although to a lesser extent than making a corresponding adjustment to the variable element.[5]

Given these two tariff parameters, the efficiency conditions described in rule 94(4)(a) and 94(5) require that the recovery in each year of any residual, expected revenue be achieved by adjusting the fixed element.

3.3. Relationship with rule 89(2)

Rule 89(2) refers to three scenarios under which a substantial deferment in depreciation may be contemplated by reference to rule 89(1), ie, where:

a. the present market for pipeline services is relatively immature;

b. the reference tariffs have been calculated on the assumption of significant market growth; and

c. the pipeline has been designed and constructed so as to accommodate future growth in demand.

Each of these scenarios gives rise to the implication that the gas pipeline has significant spare capacity, which is expected to be utilised in the future. In the ordinary course of applying the building block approach to determine total revenues for each regulatory year and then allocating this amount to derive reference tariffs, as spare pipeline capacity is utilised the revenue per unit (or reference tariff) will fall over time.

To mitigate such a fall in the revenue per unit that is to be recovered, which may not be reflected in the time profile of LRMC, rule 89(1) allows for the depreciation to be deferred or 'back-end loaded', so that total revenue rises as the market for the reference services provided by that pipeline also grows.

It follows that the scenarios contemplated in rule 89(2) as giving rise to a substantial deferment of depreciation being warranted are consistent with my opinion that efficient growth in the market for reference services will be promoted if the depreciation schedules are designed to deliver a time profile of revenue per unit that closely aligns with the time profile of LRMC.

Notwithstanding, as a matter of practical relevance, in my opinion each of these scenarios is much more likely to apply to the circumstances of a relative new, gas transmission pipeline that connects two points not previously served, as distinct from a gas distribution network serving an established urban conurbation.

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[5] The lesser degree of compromise to allocative efficiency arising from adjustments to the fixed element of a two-part tariff arises from the more limited ability of a customer to exercise discretion in relation to how much it will consume of a 'fixed' element of service – say, for example, the decision in relation to whether or not to connect to a gas supply.

3.4. Consistency with the national gas objective

The concept of allocative efficiency that underpins my discussion above of rules 89(1)(a), 89(2) and 94(5) is one of three, widely recognised dimensions of economic efficiency – the other two being productive and dynamic efficiency. The achievement of each of these forms of efficiency – including its allocative dimension – is consistent with and given force by the national gas objective (NGO), which sets the foundation for the NGRs. 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.[6]

The explicit reference in the NGO to three aspects of efficiency, being *investment* in, *operation* and *use* of natural gas services correspond, respectively, to the dynamic, productive and allocative dimensions of efficiency, as used and understood by economists.

My interpretation of rule 89(1)(a) as giving rise to an allocative efficiency criterion for selecting between alternative depreciation schedules, and its consistency with the requirements of rule 94, therefore aligns with the requirements of the NGO.

3.5. Interpretation and application of NGR requirements

It follows from the above discussion that the depreciation schedule that best promotes efficient growth in the market for reference services (as required by rule 89(1)(a)) will be that which minimises the extent of departure from LRMC pricing caused by the need to recover sufficient revenues.

I note that rule 94(5) requires that this residual is to be recovered from the tariff element (generally, being the fixed component) that minimises the distortion to efficient patterns of consumption. Nevertheless, since the existence of any residual revenue requirement gives rise to the risk of distortion to efficient patterns of consumption (as recognised under rule 94(5)), the depreciation schedule should be designed to minimise the gap between LRMC and the revenue per unit to be recovered over the life of the asset.

Applying this principle is an empirical task that requires an estimate of the future time profile of:

- the LRMC of providing the reference service;
- the revenue per unit associated with each depreciation methodology; and
- the difference between them.

I discuss the application of this principle to the particular circumstances of ATCO Gas in sections 4 and 5.

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[6] Clause 23 of the National Gas Law, National Gas (South Australia) Act 2008.

Finally, I note that my assessment of the economic principles embodied in the particular criteria set out in rule 89 is consistent with that of Jeff Balchin[7] in his report for APA GasNet, which is also accepted by Frontier Economics.[8] However, my assessment is inconsistent with analysis put forward by the Australian Energy Regulator (AER) in that same context.[9] I address the reasons for that inconsistency below.

3.6. AER's analysis of GasNet's depreciation schedules

In its 2012 assessment of the access arrangement proposed by APA GasNet, the AER rejected APA GasNet's use of straight line depreciation on the basis that it would inhibit efficient growth in the market for reference services.[10] The AER concluded that the adoption of a straight line depreciation schedule would result in:

- inefficient asset utilisation – since the depreciation schedule provided for a price path that would encourage under- or over-utilisation of the asset at different times in its life cycle;
- unnecessarily high prices in the short to medium term, which could discourage gas usage and downstream investment; and
- the inefficient management of assets by creating incentives to invest by reference to considerations other than the efficient provision of reference services.

I examine each of the AER's reasons below. As a precursor to my evaluation, it is helpful to note that straight line depreciation is a well-recognised depreciation methodology that:

- is consistent with international accounting practices;[11]
- is accepted by the Australian Tax Office, for the purposes of determining assessable income;[12] and
- has been applied by regulators in the United States in order to determine reasonable tariffs for utility service for the best part of a century.[13]

3.6.1. Inefficient asset utilisation is an empirical question

The AER concluded that APA GasNet's proposal to use straight line depreciation would be likely to lead to inefficient growth in the market because:[14]

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7 Jeff Balchin, Principal at PricewaterhouseCoopers, *Depreciation of assets under the National Gas Rules: Expert Report*, November 2012, pages 7-8.

8 Frontier Economics, *APA GasNet proposed depreciation approach – A report prepared for the Australian Energy Regulator*, January 2013, page 16.

9 AER, *Access arrangement draft decision APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2 Attachments*, September 2012, pages 176-181.

10 AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2 Attachments*, March 2013, page 98.

11 Australian Accounting Standards Board, *AASB 116 Property, Plant and Equipment (as amended)*, 2 August 2010, page 26.

12 See 'Prime cost method', ATO, *Guide to depreciating assets 2013*, June 2013, page 7.

13 See Phillips, Charles F, *The Regulation of Public Utilities, Theory and Practice*, 1993, pages 271-272.

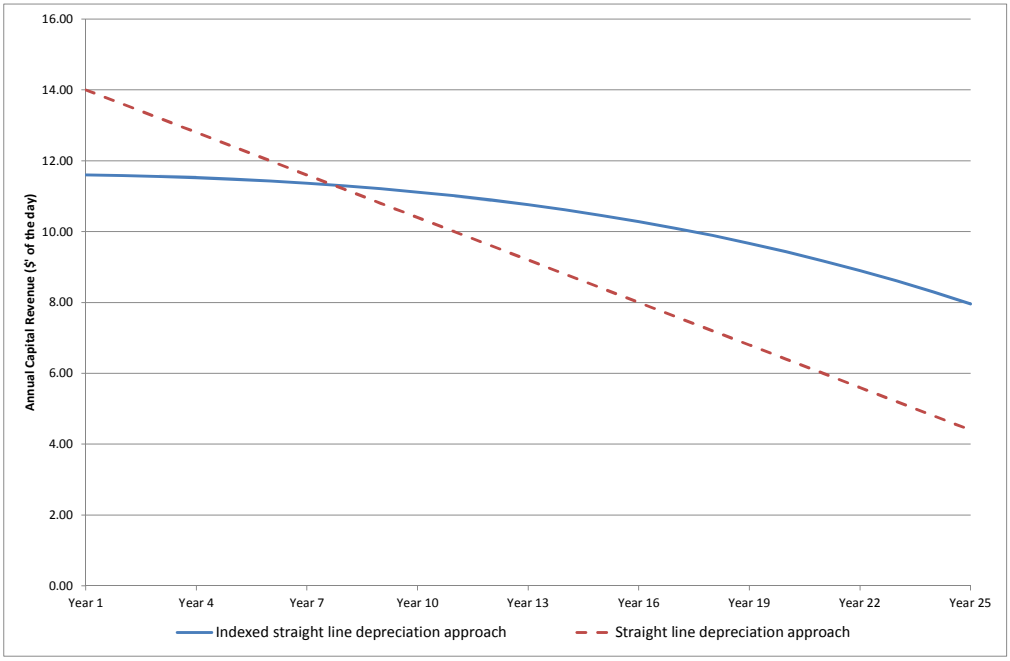
> … it unnecessarily discourages demand early in an asset's life (due to the relatively higher prices at this time) and then encourages greater use near the end of its life (due to relatively lower prices).

The AER reached this conclusion by reference to an analysis of the forecast revenue profile of a hypothetical asset, established by reference to the following parameters:

- a single initial investment of $100, with no further capital expenditure;
- constant demand for gas pipeline services;
- no operating expenditure;
- a nominal weighted average cost of capital (WACC) of 10 per cent;
- forecast inflation of 2.5 per cent asset; and
- an economic asset life of 25 years.

Using these assumptions, the AER produced a figure illustrating the time profile of revenue under the two alternative depreciation methods.[15] I have reproduced the underlying data and present this as Figure 3.1, below.

Figure 3.1
Forecast revenue profile under different depreciation approaches



14 AER, *Access arrangement draft decision APA GasNet Australia (Operations) Pty Ltd 2013-17*, Part 2 Attachments, September 2012, page 178.

15 See Figure 5.1, AER, *Access arrangement draft decision APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2 Attachments*, September 2012, page 178.

Drawing on this material, the AER concluded that the use of straight line depreciation together with a unindexed capital base would result in prices that are relatively higher early in an asset's life and relatively lower at the end of the asset's life, as compared with the alternative indexed straight line depreciation approach.

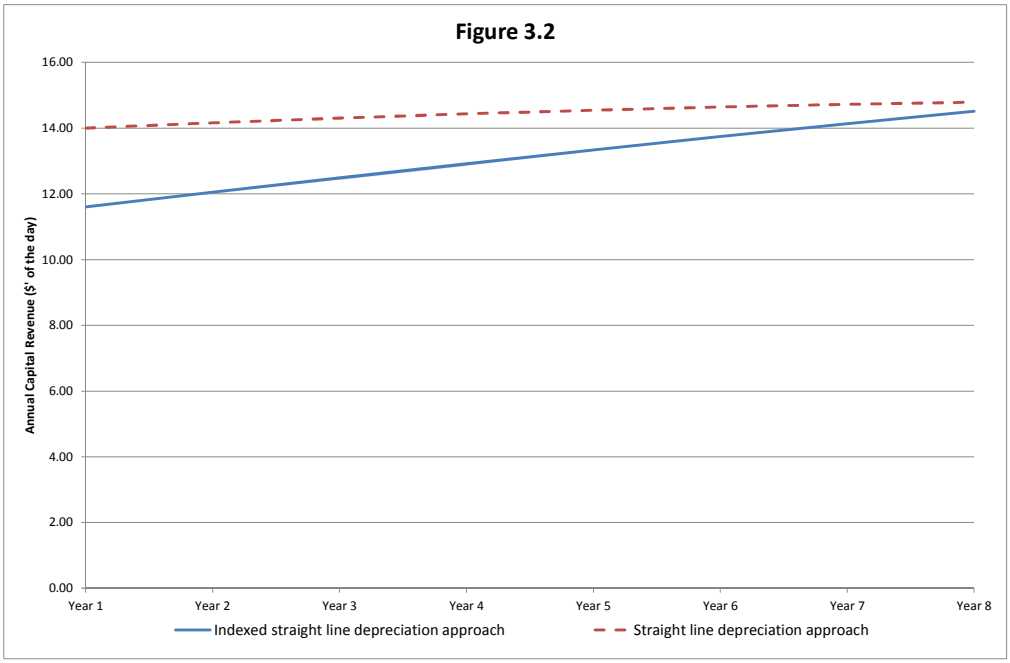
Correspondingly, the AER also concluded that indexed straight line depreciation, together with an indexed capital base, results in more constant annual profile of total annual revenue, as compared with straight line depreciation together with an unindexed capital base.

In my opinion, the simplifications in the AER's analysis mean that it provides very little insight into the effect that alternative depreciation methodologies are likely to have on the level of prices actually paid by users of a particular pipeline service. In particular, the AER's analysis does not take into account that:

- reference services are normally provided using assets with a mix of age and/or remaining economic life, ie:
  - new assets as well as assets coming to the end of their economic life; and
  - assets with different economic lives;
- the sustained provision of reference services generally requires a degree of ongoing capital investment;
- demand for reference services is likely to change over time;
- operating costs as well as the unit costs of anticipated capital investment are also likely to change over time; and
- regulatory and legislative requirements also tend to change through time.

Each of these factors will affect the time profile of revenue per unit. For example, adopting the pipeline characteristics used by the AER but adding an ongoing, annual capital expenditure requirement of $4 (say, to reflect the replacement expenditure implied by the AER's assumption as to the asset's economic life) results in a very different forecast revenue profile. I illustrate the effect of such a change at Figure 3.2.

Figure 3.2
Forecast revenue profile (with capex) under different depreciation approaches



Source: NERA calculation

Under this scenario, the use of indexed straight line depreciation (together with an indexed asset base) results in an inclining revenue requirement. In contrast, the use of straight line depreciation (together with an unindexed asset base) leads to a relatively flat revenue requirement.

In my opinion, the significance of this one adjustment reinforces that the analysis of the time profile of revenue per unit associated with a particular depreciation schedule is an empirical question. It can only be addressed by reference to the particular circumstances of each gas pipeline.

3.6.2. Prices should be assessed over the short, medium and long term

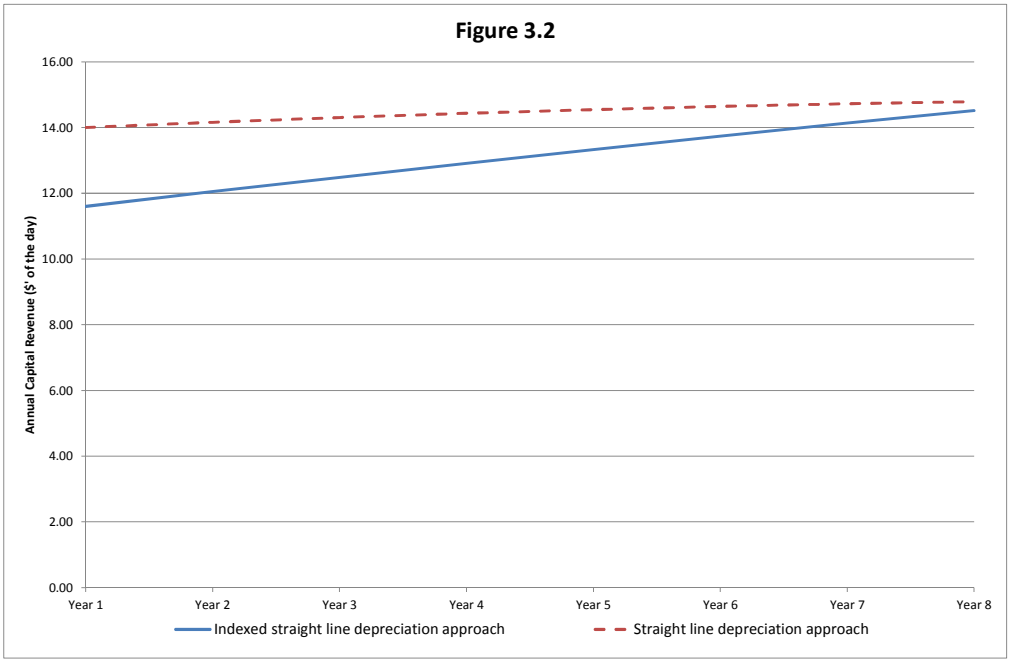
The AER also concluded that switching from an indexed straight line to a straight line depreciation methodology would result in unnecessarily high prices in the short to medium term.

I do not disagree that adopting a straight line depreciation methodology will cause tariffs to be relatively higher in the 'short to medium term', as compared with an indexed straight line depreciation approach. This is because the choice of depreciation schedule is necessarily a trade-off between either:

- higher revenues in the near term and lower revenues in the future; or
- lower revenues in the near term and higher revenues in the future.

However, restricting the analysis to the short to medium term necessarily begets the conclusion that a depreciation method involving deferred revenues is more favourable, at least for users. I illustrate this point in Figure 3.3 below, which reproduces Figure 3.2 but focusing only on the first eight years.

Figure 3.3
Forecast revenue profile in the short to medium term



Source: NERA calculation

Figure 3.2 and Figure 3.3 show that the use of straight line depreciation and an unindexed capital base results in a higher revenue allowance in the first eight years of the economic life of an asset, as compared with the use of indexed straight line depreciation and an indexed capital base. However, limiting the analysis to the first eight years may encourage the incorrect conclusion that indexed straight line depreciation together with an indexed capital base is more consistent with growth in the market for gas pipeline services, because it results in lower prices in the eight year assessment period.

By contrast, when assessed over the life of the asset, Figure 3.2 shows that the use of straight line depreciation (together with a non-indexed capital base) results in a more constant revenue per unit over the life of the asset.

In my opinion, there is no reason to limit an assessment of deprecation methodologies to the short to medium term: the implications of one depreciation schedule relative to another can only be properly understood if assessed over the life of an asset.

3.6.3. Assets management is independent of regulatory depreciation

The third reason given by the AER for rejecting the proposed use of straight line depreciation together with an unindexed capital base is that it results in a lower capital base, as compared with the use of indexed straight line depreciation and an indexed capital base. Drawing on that observation, the AER then contends that a lower capital base may encourage a gas pipeline to replace its assets sooner than may otherwise be the case, in order to increase the quantum of the return on capital building block that it is able to earn on the newly replaced asset. The AER then concludes that this would be at odds with the efficient provision of reference services.

In my opinion, the AER's reasoning is not well founded. First, it presupposes that the time profile of the aggregate capital base will fall as the AER suggests when, in fact, this is only likely to be the case for a single asset pipeline that undertakes no capital expenditure until the very end of that single asset's life. In contrast, I showed in Figure 3.2 that, under assumptions that are more in keeping with the ongoing, incremental commitment of new capital, the capital base (and associated total revenue) is unlikely to fall over time as the AER suggests.

Second, the AER's analysis of incentives only takes into account the additional revenue that a new investment may generate. In practice, a service provider must commit new capital in order to secure that higher revenue, and so can also be expected to consider the additional capital costs of such new investment.

The cost to a service provider of any new investment is the associated opportunity cost of investing the new capital. Given that the rate of return that a gas pipeline may earn on a new investment is to be *commensurate with the efficient financing costs of a benchmark efficient entity*[16] the cost of making a new investment should equal the revenue that a gas pipeline earns on the replacement of a new asset. In other words, a decision to replace an existing asset is independent of its regulatory value, since the additional revenue gained from investing in a new asset equals the opportunity cost of the new investment.

I note that APA GasNet correctly pointed out that replacement investment decisions are predominately driven by external factors, such as location of gas supply, changes in demand and the need to maintain security of supply, rather than the remaining value of an asset in its capital base. APA GasNet also noted that any asset replacement program is subject to oversight and approval by the AER in its review of each proposed access arrangement.

In my opinion, the risk of inefficient asset management on account of adopting a higher depreciation allowance in the early years of an asset's life is likely to be 'negligible'.

[16] See rule 87 of the NGR.

4. Falling Trend for LRMC

In this section I explain the concept of long run marginal cost in more detail, as well as the basis for my expectation that the LRMC of the reference services provided by ATCO Gas's distribution business can be expected to fall over time.

I have not estimated a specific time profile for the LRMC of the reference services provided by ATCO Gas. This would be a detailed, complex task that, in my opinion, is unwarranted for the purpose of addressing the questions put to me by JWS.

Rather, I have examined both the theory and the evidence in relation to long term price trends for the principal inputs used by ATCO Gas for the provision of reference services. In my opinion, both those considerations lend themselves strongly to the conclusion that the LRMC of ATCO Gas's reference service is likely to be falling over time.

4.1. Definition of LRMC

Marginal cost is the additional cost incurred as a result of increasing output by one (or a small number of) unit(s) of production. Marginal cost can be estimated by reference to either the short or long run change in costs arising from a specified change in output. The essential difference between short run marginal cost (SRMC) and LRMC is the time frame over which the postulated increment in output and the associated change in costs is estimated.

The significance of adopting one or other time frames is that, in the short run, at least one factor of production (usually, capital inputs that in turn determine maximum production capacity) is taken to be fixed. By contrast, LRMC is estimated by adopting a time frame sufficient to allow all factors of production to be adjusted in order to meet the corresponding change in demand.

Since capacity is fixed in the short run, the estimation of SRMC is generally limited[17] to the change in operating costs that are needed to expand production. By contrast, in the long run the amount and timing of future investment can be altered, which allows for all factors of production to be varied. LRMC therefore captures the changes in both operating and capital costs associated with the investment that is required to meet the postulated change in demand.

LRMC is a strictly forward-looking concept. It must be estimated by reference to a particular point in time, and considers the change in future costs – assessed at that point in time – consequent upon a postulated change in future demand. It follows that the LRMC of providing a particular service changes over time.

LRMC can be significantly affected by the balance between existing capacity and anticipated demand – since those variables together govern both the timing and quantum of necessary future capacity expansions. It is also affected by future changes in the unit cost of capital

[17] In the event that the postulated change in demand is unable to be met because – by definition – production capacity cannot be varied in the time frame, SRMC also includes the cost of curtailing demand to a sufficient degree that it does not exceed the total available production capacity. Put another way, properly estimated, SRMC also provides for the existence of a congestion cost element.

assets, and the labour inputs needed to operate those assets. Assuming that the capacity and anticipated demand remain in balance, the future LRMC will fall if the price of capital and operating inputs (after adjustment for inflation) are also falling over time.

I have undertaken an assessment of the balance between ATCO Gas's capital and operating cost inputs, and the likely time path for the inflation adjusted or 'constant price' value of these costs over time in section 4.2 below.

4.2. ATCO Gas's LRMC will fall over time

There are strong theoretical and empirical grounds for expecting that ATCO Gas's LRMC will fall over time. I base this expectation on the composition of ATCO Gas's costs, and both the theory and empirical evidence in relation to long term price trends for the principal inputs used by ATCO Gas. I set out my reasoning below.

4.2.1. Long term economic relationships

The economic relationships that underpin long term trends in economic growth can be used to draw 'in principle' conclusions in relation to the long term trend in the unit price of capital assets, relative to those for labour. In particular, the unit price of capital assets can be expected to fall over time, relative to economy-wide consumer prices. By contrast, the unit cost of labour and land can be expected to rise over time, relative to economy-wide consumer prices.

The rationale for these relationships arises from the fact that, over the long term:

- the change in economy-wide consumer prices reflects the change in the cost of producing the basket of goods and services that make up the consumer price index;[18]
- production of any form involves the combining of three basic inputs or resources, ie, land, labour and capital;
- productivity refers to the efficiency with which these inputs can be combined to create the outputs (being consumer goods and services) desired by society;
- given that the supply of land and labour are subject to intrinsic limitations, technological progress (and the associated productivity gain) typically manifests itself as improvements in the efficiency with which capital assets are created, thereby enabling more to be produced from the same quantity of labour/land;
- the long term trend in the price of capital, labour and land inputs, when weighted as to their relative share in the production of goods and services, must not systematically differ from the long term trend in the CPI; and
- it follows that the expectation of productivity increases over time means that:

[18] I recognise that the presence of exported production and imported consumer goods means that the near term relationship between producer and consumer prices may not be precise. However, the extent of any potential divergence on this account is not sufficient to alter the long run economic relationships I describe here.

- the unit price of labour (and land) tends to rise relative to the CPI, since each unit of labour or land contributes to steadily greater quantities of output, while its supply is constrained; and
- by contrast, the price of capital goods – expressed per unit of output – tends to fall.

The consequence of these inexorable, long term trends is that:

- the price – measured in in constant price terms – of goods and services that are produced with a relatively greater proportion of capital inputs (such as cars, airline tickets, televisions, etc) tends to fall; while
- the price – again, measured in constant price terms – of goods and services produced with a relatively greater proportion of labour inputs (haircuts, professional services, etc) tends to rise.

The implication of these economic relationships for expectations as to the long term trend in the cost of producing any particular good or service is therefore governed by the capital intensity with which it is produced, relative to other consumer goods or services.

I discuss the capital intensity of ATCO Gas's distribution network below.

4.2.2. ATCO Gas's cost structure

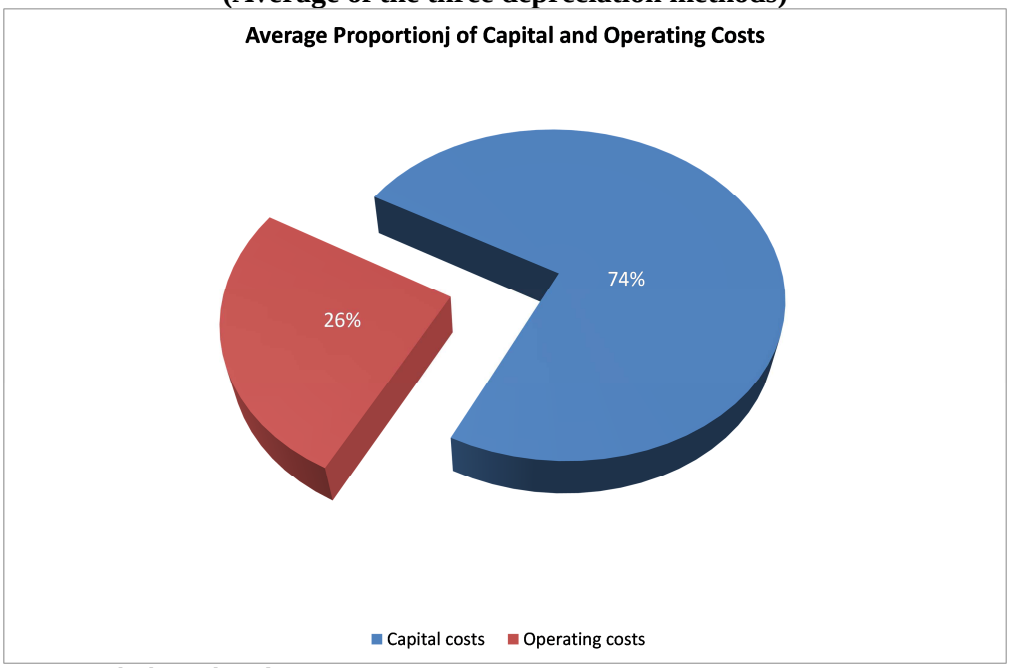
ATCO Gas classifies its capital and operating cost inputs by reference to their principal function, as identified in Table 4.1 below.

Table 4.1
ATCO Gas's Capital and Operating Expenditure Categories

Capital Expenditure	Operating Expenditure
High pressure mains	Network
Medium pressure mains	Marketing
Medium/low pressure mains	Corporate
Low pressure mains	Information technology
Regulators	Full retail contestability
Secondary gate stations	Regulatory Cost
Buildings	Ancillary Services
Meter and services pipes	Unaccounted for gas
Equipment and vehicles	
Information technology	
Full retail contestability	
Land	

Capital-related costs account for a large proportion of ATCO Gas's total costs; presently, more than 55 per cent.[19] Moreover, capital-related costs are expected to increase so that, going forward, ATCO expects the capital intensity of its future costs, averaged over the period up to and including 2080 (see Figure 4.1 below) to be approximately 74 per cent.

Figure 4.1
Capital and Operating Costs as a Percentage of Total Costs
(Average of the three depreciation methods)



Source: NERA calculation based on ATCO input assumptions.

On the assumption that the capital intensity of the gas distribution service provided by ATCO exceeds that for the economy as a whole, the LRMC of that service can be expected to fall over time, relative to the average change in consumer prices.

The robustness of my assumption as to the relative capital intensity of ATCO Gas's reference service, and the validity of the long term economic relationships that I explain above, can be assessed by examining long run historic trends in available indices of similar capital and operating cost items.

I present this analysis in the following section.

[19] Capital-related costs include the required return on capital, economic depreciation, and the cost of tax. Information provided by ATCO Gas suggests that, in the second half of 2014, capital-related costs are estimated to be more than 56 per cent of total costs, under all three depreciation scenarios.

4.2.3. Evidence of long term cost trends

I explained in section 4.1 that, at any particular point in time, LRMC reflects the change in future operating and capital expenditure required to meet a long term change in demand from that time. If operating and capital expenditure – or the combined total of these costs – are falling (increasing) in constant price (or, inflation adjusted) terms over time, then LRMC estimated at future points in time will also decline (increase), assuming the relationship between demand and capacity at those future points in time remains constant.

In order to assess the likely time profile of LRMC for the reference service provided by ATCO Gas, I undertook an analysis of the likely trend in operating costs and capital costs over time.

The Australian Bureau of Statistics (ABS) publishes time series data on private new capital expenditure undertaken across the economy, including that in relation to 'Electricity, Gas, Water and Waste Services'.[20] These data include current price and chain volume series on total capital expenditure in Australia – chain volume measures indicate changes in quantity between time periods by holding the price of the goods and services constant.[21]

In order to estimate a constant price index for capital expenditure, I derived an implicit price deflator by dividing the current price expenditure series by the corresponding chain volume measure (hereafter the 'implicit capital price deflator').[22]

There are no similar operating expenditure measures available from the ABS. However, given that labour costs are generally a significant proportion of a firm's total operating costs, I examined changes in labour costs in order to estimate (by way of proxy) the constant price changes in operating costs over time.

The ABS publishes a number of labour and wage measures, of which at least two are relevant for measuring the change in the cost of labour over time, namely:

- the Wage Price Index (WPI) – this measures the change in the price of wages and salaries in the Australian labour market. The ABS provides these data at the industry level and I have used the WPI of the total hourly pay excluding bonuses for those employed in privately owned electricity, gas, water and waste services (hereafter 'WPI Energy and Water');[23] and

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[20] See ABS, 5625.0 - Private New Capital Expenditure and Expected Expenditure, http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/C6EF1D79E13B24EACA257235007866B1?OpenDocument.

[21] ABS, Demystifying Chain Volume Measures, http://www.abs.gov.au/Ausstats/abs@.nsf/0/95ce2d6796bd15aeca256db800754639/$FILE/ATT4T7WF/Demystifying%20Chain%20Volume%20Measures_1.pdf.

[22] I calculated the implicit price deflator using seasonally adjusted quarterly data relating to total capital expenditure. These data were obtained from ABS tables 5625.0 Table 1E and Table 3B.

[23] See ABS, 6345.0 - Wage Price Index, Australia, http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/3F85BC8B42C2D64ECA257B17000D36FC?OpenDocument. Specifically, data were obtained from ABS tables: 6345.0 All WPI Series: Original (Quarterly Index Numbers).

- Unit Labour Costs (ULC) – measures the average cost of labour per unit of output. The ABS does not publish these data at the industry level, but instead provides ULC series for: (1) all industries; and (2) all industries excluding agriculture. For the time series I present below, I selected the ULC seasonally adjusted series for all industries excluding agriculture (hereafter 'ULC Non-Farm').[24]

Both of these labour cost measures are published in the form of index numbers, with the movement from one quarter to the next representing the change in current prices. In order to derive a constant price series, I converted the above, current price indices by adjusting each for the corresponding change in the consumer price index (CPI).[25]

These measures of the inflation adjusted price of capital expenditure (capital implicit price deflator) in the provision of electricity, gas, water and wastewater services and, similarly, the inflation adjusted price of labour – as a proxy for operating expenditure – show clearly that, in constant price terms, the long term trend is for:

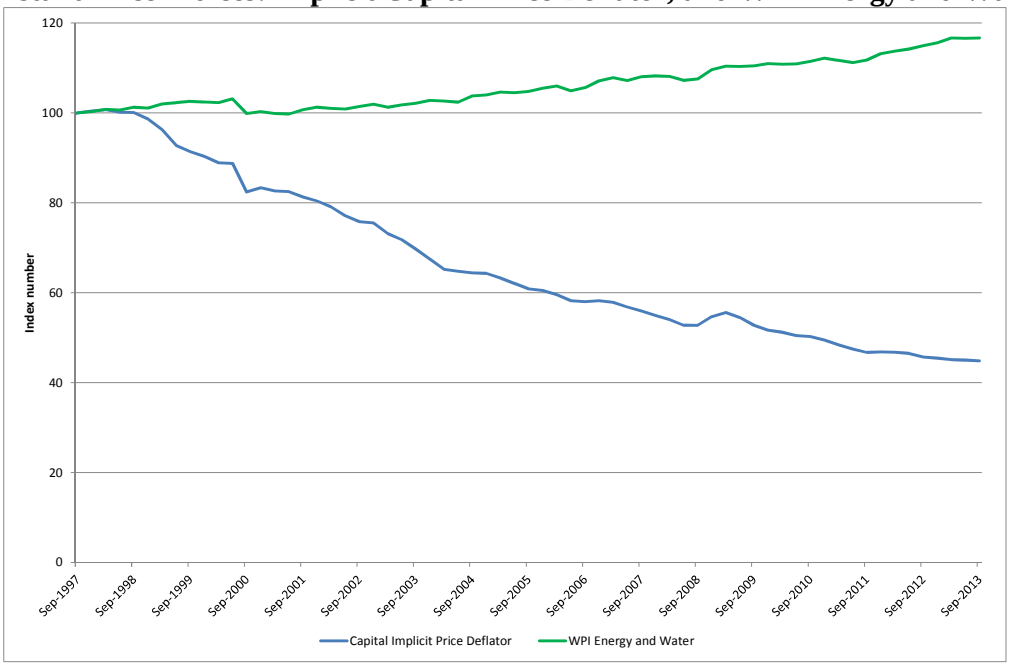
- the price of capital expenditure to fall over time; and
- the price of labour – as a proxy for operating costs – to increase slightly over time.

I present the long term trends in the capital expenditure implicit price deflator, along with those for WPI Energy and Water, and ULC Non-Farm, in Figure 4.2 and Figure 4.3, below.

[24] See ABS, 5206.0 - Australian National Accounts: National Income, Expenditure and Product, Table 38, http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5206.0Sep%202013?OpenDocument.

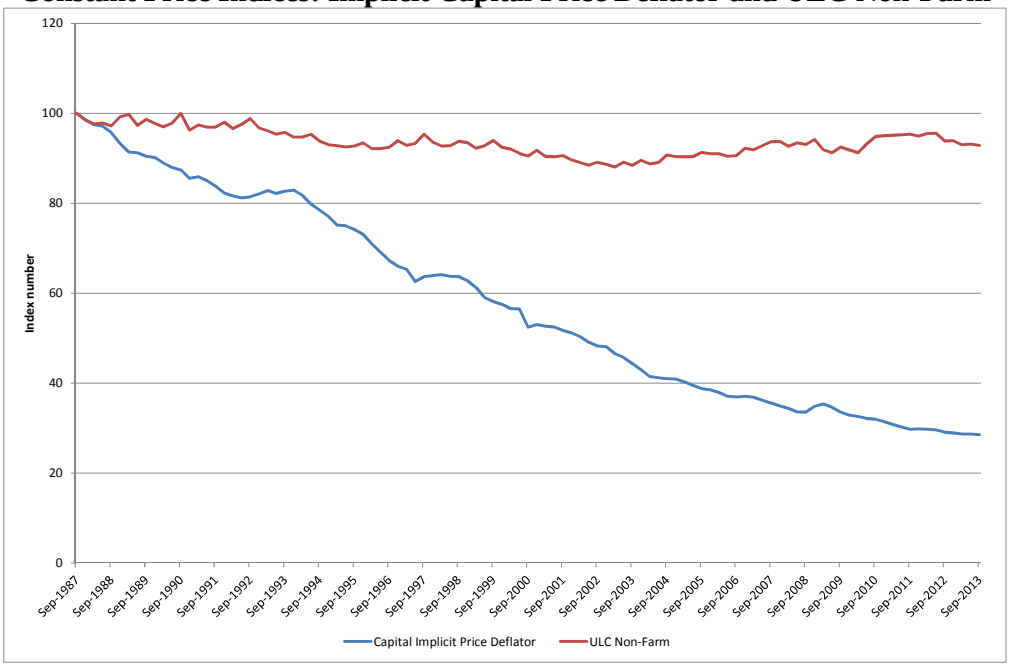
[25] This involved the following steps: (1) convert each index, including the CPI, to be based to 100 in the same year; and (2) divide each nominal index by the CPI.

Figure 4.2
Constant Price Indices: Implicit Capital Price Deflator, and WPI Energy and Water



Source: ABS Tables, 5625.0 Table 1E and Table 3B; and 6345.0 All WPI Series: Original (Quarterly Index Numbers).

Figure 4.3
Constant Price Indices: Implicit Capital Price Deflator and ULC Non-Farm



Source: ABS Tables, 5625.0 Table 1E and Table 3B, and 5206.0 Table 38.

In my opinion, these historic price series confirm the nature of the long term economic relationships between the price of capital goods and the price of labour that I discuss above.

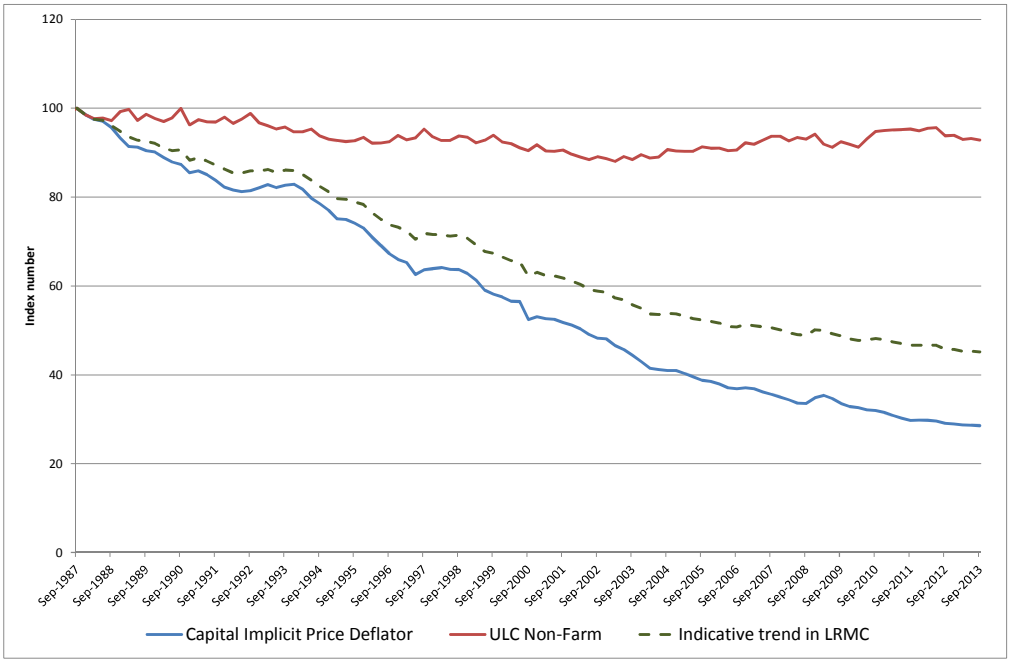
Since ATCO Gas's capital-related costs exceed its operating costs, its LRMC is very likely to decline over time, because:

- ATCO Gas's capital-related costs are greater than its operating costs, and the difference in the relative contribution of these two forms of cost is expected to increase over time; and
- over time, capital costs are expected to fall in constant price terms, by a greater amount than operating costs are expected to increase.

Figure 4.4, presents an indicative trend in LRMC on account of past performance of these indices. I derived an indicative LRMC by weighting the implicit capital price deflator and constant price ULC Non-Farm costs indices by the proportion of capital and operating costs to total costs, as estimated in Figure 4.1.

Over the 26 years of available data, the indicative LRMC trend has fallen by 1.44 per cent per annum.

Figure 4.4
Constance Price Indices: Indicative LRMC trend, Capital Implicit Price Deflator and ULC Non-Farm



5. Rising Long Term Price Level

ATCO Gas has modelled three different potential depreciation options and so time paths of total revenue. Each model adopts a building block approach; however, the price paths vary according to whether or not they provide for the capital base to be indexed. The three price paths modelled by ATCO Gas are distinguished by their use of:

- an indexed straight line depreciation approach, in conjunction with an indexed capital base;
- a straight line depreciation approach, in conjunction with a unindexed capital base; and
- a transition method of depreciation and indexation.

In the remainder of this section, I describe the methodology used to calculate total revenue under each of the above models before then comparing the long term price levels derived under each.

5.1. Common building blocks

I estimated the total annual revenue using a post-tax revenue model framework consistent with the requirements of rule 76 of the NGR. Total revenue for each year is calculated using a building block approach that comprises:[26]

- a return on the capital base;
- depreciation on the capital base;
- corporate income tax;
- operating efficiency gains or losses; and
- forecast operating expenditure.

I projected each of the three price paths over a 65 year period with common assumptions in relation to all variables, except that for depreciation. The principal input assumptions are that:

- the return on the capital base is calculated by applying a rate of return to the capital base;
- a nominal vanilla rate of return of 8.53 per cent is applied for the period post 1 July 2014;
- a forecast inflation rate of 2.5 per cent is applied for the period post 1 July 2014;
- tax depreciation (as set out in Appendix B), the company income tax rate (30 per cent) and the value of imputation credits created (25 per cent) are each used to calculate the level of tax compensation;
- operating costs, as set out in Appendix B;
- demand (expressed in terms of both total gas delivered (GJ) and number of connections); and

[26] See rule 76 of the NGR.

- the capital expenditure profile, as set out in Appendix B.

5.2. Indexed straight line depreciation

Under the indexed straight line depreciation approach, the capital base is escalated through time for the expected change in the all groups, Consumer Price Index (CPI) measured as a weighted average of eight capital cities. Indexed straight line depreciation is applied to the indexed capital base. Regulatory depreciation for each asset (or asset group) is calculated using the following formula:

$$Dep_t = \frac{ORAB_t \times (1 + \rho^e)}{RemLife_t} - ORAB_t \times \rho^e$$

where:

Dep_t	is the regulatory depreciation in year *t*
$ORAB_t$	is the opening capital base in year *t*
ρ^e	is the expected inflation rate
$RemLife_t$	is the remaining life of the asset (or asset group) at the start of year *t*.

Under this approach the closing capital base for each year is calculated as:

- the opening capital base; plus
- nominal capital expenditure; less
- indexed straight line depreciation, ie, the inflation adjusted opening capital base divided by the remaining asset life, less the inflation indexation on the opening capital base.

5.3. Straight line depreciation

In this modelled price scenario the capital base is not escalated for changes in the general prices. Regulatory depreciation for each asset (or group of assets) is calculated using a straight line depreciation approach, ie:

$$Dep_t = \frac{ORAB_t}{RemLife_t}$$

Under this approach the closing capital base for each year is calculated as:

- the opening capital base; plus
- nominal capital expenditure; less
- regulatory depreciation, ie, straight line depreciation.

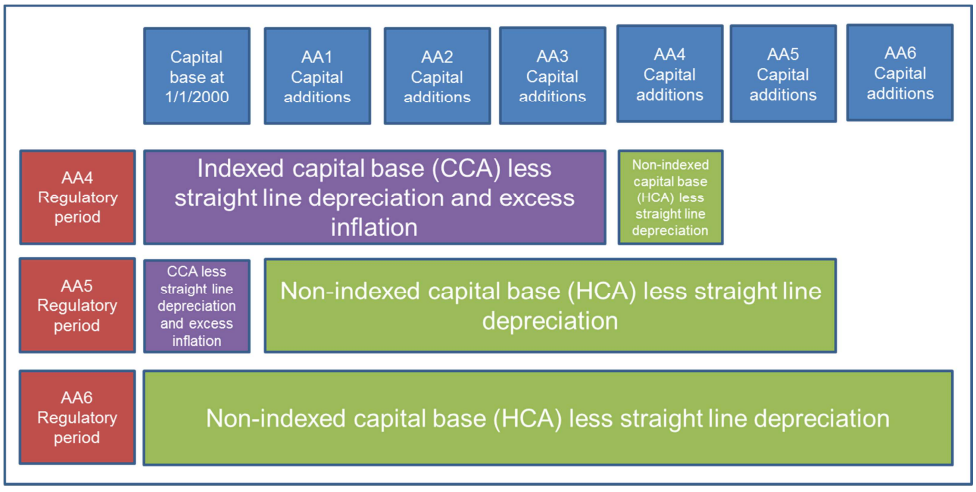
5.4. The transition method

In the transition method the capital base is rolled forward using a combination of the above two scenarios. Under this approach the treatment of assets in the capital base is as follows:

1. All capital expenditure undertaken from 1 July 2014 is unindexed, and is depreciated using a straight line depreciation approach (as described in section 5.3);
2. All capital expenditure undertaken between from 1 July 2000 and 30 June 2014 will:
   - in access arrangement period four, be indexed and depreciated using an indexed straight line depreciation approach (as described in section 5.2);and
   - from access arrangement period five onward (ie, from 1 January 2020), be depreciated using a straight line depreciation approach and will no longer be indexed (as described in section 5.3);
3. All assets in existence at 30 June 2000 will:
   - in access arrangement periods four and five be indexed and depreciated using a corresponding indexed straight line depreciation approach (as described in section 5.2); and
   - from access arrangement period six (ie, from 1 January 2025), be depreciated using a straight line depreciation approach and no longer be indexed (as described in section 5.3).

Figure 5.1 depicts ATCO Gas's proposed transition method, the purpose of which is to transition from the use of indexed straight line depreciation to straight line depreciation.[27]

Figure 5.1
ATCO Gas's Proposed Transition Method



[27] I note that the transition method progressively replaces indexed straight line depreciation with straight line depreciation. This has the effect of smoothing short term price effects that would otherwise occur if straight line depreciation was to be adopted immediately.

5.5. Comparison of long term price levels

In order to compare the long term price levels under each scenario, I converted the total revenue calculated under each model to the total revenue per GJ. In other words, for each of the three models, I divided the total revenue for the year by the corresponding total volume, and then adjusted the per unit figure by inflation. Figure 5.2 below depicts the total revenue per GJ (and total revenue per delivery point) in constant price terms, for each scenario.

Figure 5.2 and Figure 5.3 show that ATCO Gas is anticipating the revenue per unit of output to rise over the assessment period, irrespective of the depreciation methodology. Adopting indexed straight line depreciation together with an indexed capital base results in average revenue (in constant July 2014 price terms) rising from $6.20 per GJ and $255 per delivery point in the second half of 2014 to $14.03 per GJ and $520 per delivery point in 2080. This can alternatively be expressed as a rise in inflation adjusted prices of:

- 126 per cent in per GJ terms; and
- 104 per cent in per delivery point terms.

Adopting straight line depreciation together an unindexed capital base results in average revenue (in constant July 2014 price terms) rising from $7.32 per GJ and $304 per delivery point in the second half of 2014 to $12.76 per GJ and $474 per delivery point in 2080. This amounts to a rise in inflation adjusted prices of:

- 74 per cent in per GJ terms; and
- 57 per cent in per delivery point terms.

Finally, adopting ATCO Gas's transition method results in average revenue (in constant price terms) rising from $6.20 per GJ and $255 per delivery point in the second half of 2014 to $12.77 per GJ and $474 per delivery point in 2080. This amounts to a rise in inflation adjusted prices of:

- 106 per cent in per GJ terms; and
- 86 per cent in per delivery point terms.

Figure 5.2
Total Revenue per GJ, Constant Prices

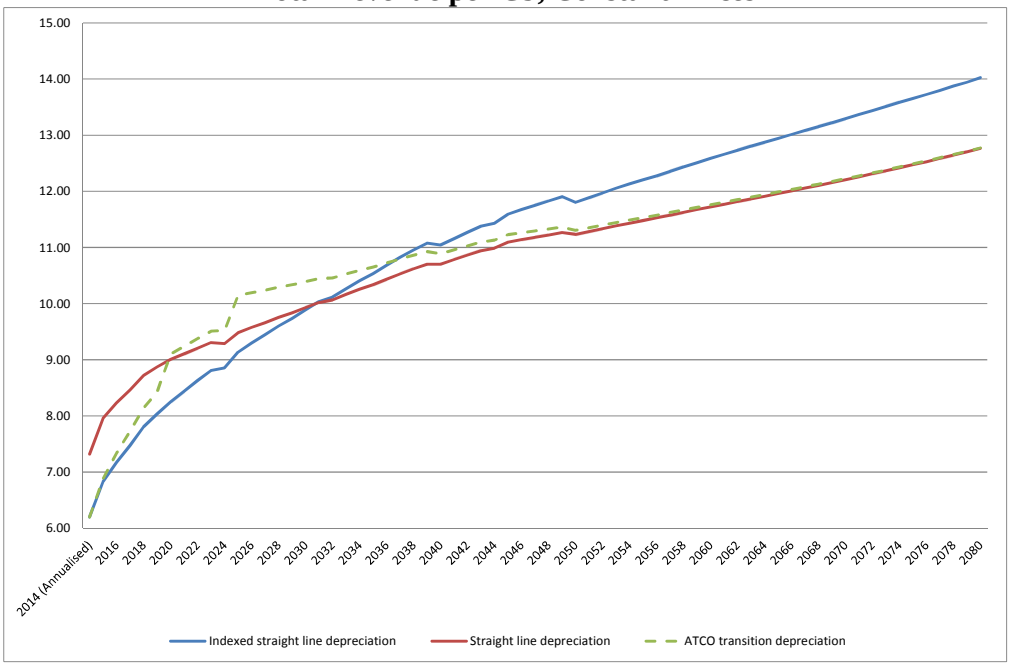
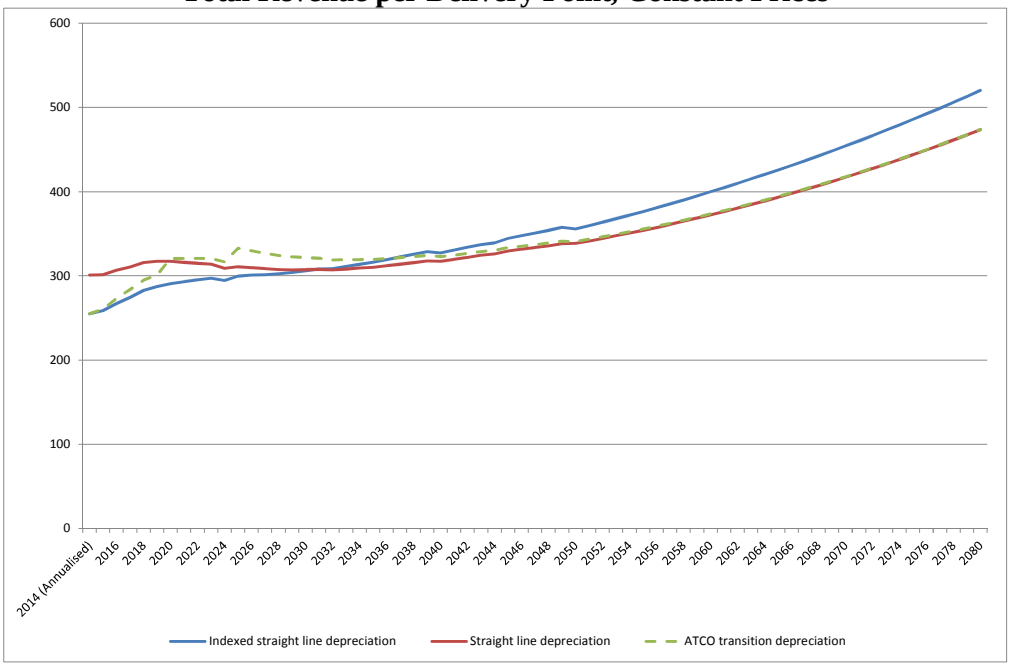


Figure 5.3
Total Revenue per Delivery Point, Constant Prices



In other words, total revenue (and so revenue per unit of output) increases over time under all three scenarios. The adoption of straight line depreciation together with an unindexed capital base provides the lowest variation in revenue per unit of output over time.

I note that, prior to 2028, the use of indexed straight line depreciation together with an indexed capital base provides the lowest revenue per unit of output, after which the straight line depreciation together with an unindexed capital base gives rise to the lowest revenue per unit of output. Generally, the transition method results in revenue per unit of output that lies between the other two – excluding the period between 2024 and 2035 inclusive.

The rankings of the three pricing approaches, by reference to which has the lowest revenue per unit of output, change over time on account of two factors, ie:

- different starting values; and
- different rates of change in the unit price per GJ.

The straight line depreciation approach results in a higher starting value (of $7.32 in July 2014 dollar terms), as compared with the indexed capital base and transition models ($6.20 in July 2014 dollars terms). In order to compare the differing rates of change in the unit prices, I indexed the revenue per GJ so as to start at 100 in 2014 for all three models – see Figure 5.4 below.

Figure 5.4
Change in Unit Price per GJ, Constant Prices

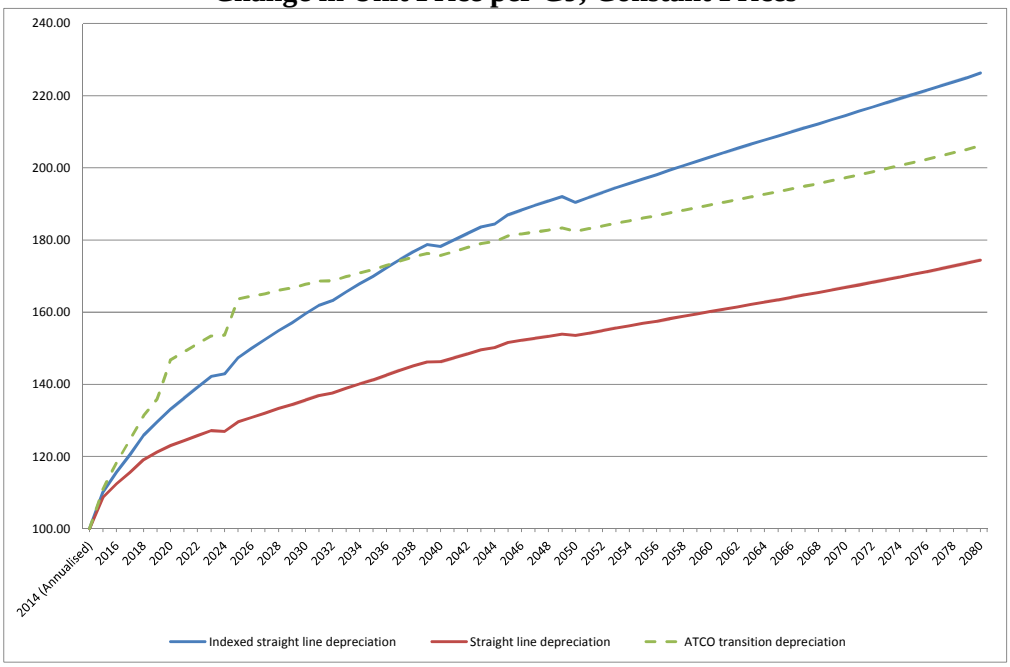
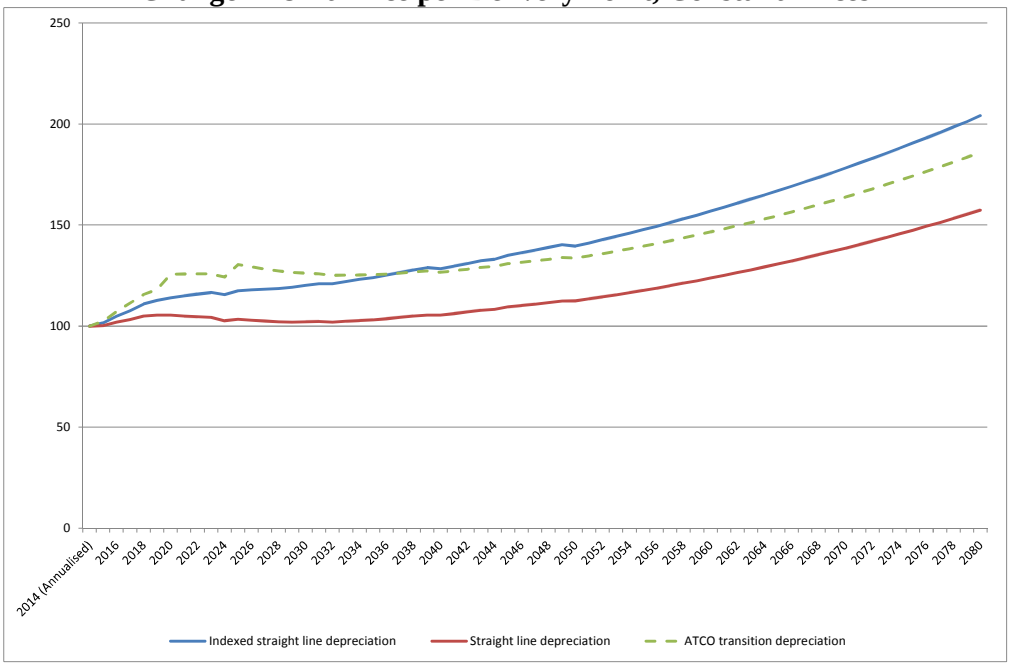


Figure 5.5
Change in Unit Price per Delivery Point, Constant Prices



Unit prices increase at the slowest rate under the straight line depreciation approach. Comparatively, unit prices increase at the fastest rate under the transition depreciation method prior to 2036, from which point the unit prices calculated under the indexed capital base exhibit the highest growth.

6. Conclusion

JWS has asked me to explain, from an economic expert point of view, the economic function of various rules governing the choice of depreciation schedule, with particular attention to rule 89(1)(a), which requires a depreciation schedule to be designed so that reference tariffs vary over time 'in a way that promotes efficient growth in the market for reference services'.

In my opinion, efficient growth in the market for gas pipeline services will be promoted by tariffs that reflect – at each and every point in time – the marginal cost of providing the particular service in question. Such tariffs ensure that users are presented with a financial signal as to the resource cost of providing the service, thereby encouraging them to consume the service only when the benefit to them exceeds the cost of its provision. In economics, tariffs that reflect this principle are said to be 'allocatively efficient'.

The design of allocatively efficient tariffs in circumstances where capital costs previously incurred (as represented by the capital base) need to be recovered – in order to ensure that service providers will be willing to invest in future, long lived assets – is best achieved through the use of a two part tariff. This is reflected in the provisions in rule 94(4), which specifically provide for the design of reference tariffs that consist of two or more charging parameters.

An allocatively efficient two part tariff should be designed so that:

- the variable tariff element (being that typically applying to the service component for which the customer has greatest ability to exercise discretion as to how much it will consume) is set as close as practicable to the long run marginal cost (LRMC) of the resources used to provide that (variable) element of service; and
- the fixed tariff element (being that typically applying to the service component for which the customer has limited ability to exercise discretion as to how much it will consume) is set so as to recover the residual revenue requirement in that year.

These principles are reflected in the combination of rule 94(4)(a) and rule 94(5).

It follows that the depreciation schedule that best promotes efficient growth in the market for reference services - as required by rule 89(1)(a) - will be that which minimises the extent of departure from LRMC pricing caused by the need to recover sufficient revenues.

Although the choice of depreciation methodology clearly affects the time profile of revenue per unit, it is not the only factor that affects revenue per unit over time, which also depends on factors such as:

- changes in operating and maintenance costs through time;
- the quantum and timing of new capital investments;
- the mix of assets (with different economic lives) used to provide regulated services;
- changes in the allowed rate of return;
- growth in demand over time for regulated services; and
- the cost of company income tax.

An assessment of different depreciation methodologies therefore requires one to consider the particular circumstances of the gas pipeline and to compare the time profile of:

- the anticipated LRMC of providing reference services; and
- forecasts of the average level of prices, ie, revenue per unit of output.

In section four, I find that the LRMC of gas pipeline services provided by ATCO Gas is likely to fall (in constant price terms) over time. I reach this conclusion because:

- ATCO Gas's capital costs are greater than its operating costs, and this difference is expected to increase over time; and
- in constant price terms, capital costs can be expected to fall over time, and by a much greater amount than operating costs are likely to increase.

In contrast, ATCO forecasts that the average level of revenue per unit of output will increase through time, in constant price terms. This anticipated increase in revenue per unit of output over time is:

- greatest when revenues are calculated using indexed straight line depreciation together with an indexed capital base;
- lowest when revenues are calculated using straight line depreciation together with a non-indexed capital base; while
- the transition method results in a time profile of revenue per unit that amounts to a compromise between the other two approaches.

In Appendix A I present analysis of the sensitivity of these findings to different assumptions as to ATCO Gas's forecasts of future operating and capital expenditure requirements, and demand. I find that these conclusions do not change if I adjust ATCO Gas's forecasts of operating expenditure, demand and capital expenditure.[28]

It follows that the depreciation methodology that gives rise to the smallest increase in revenue per unit through time is likely to minimise the difference from the long term trend in the LRMC of providing gas distribution services.

Figure 6.1 and Figure 6.2 illustrate the time profile of revenue per unit of gas delivered and per delivery point in constant price terms, together with an indicative LRMC trend. These figures illustrate that ATCO Gas's revenue per unit will increase through time under each of the depreciation scenarios. In contrast the LRMC of providing reference services is very likely to fall through time.

[28] In each scenario, I adopt inputs that have the effect of lowering the future level of gas distribution prices.

Figure 6.1
Change in Unit Price per GJ and Indicative LRMC Trend, Constant Prices

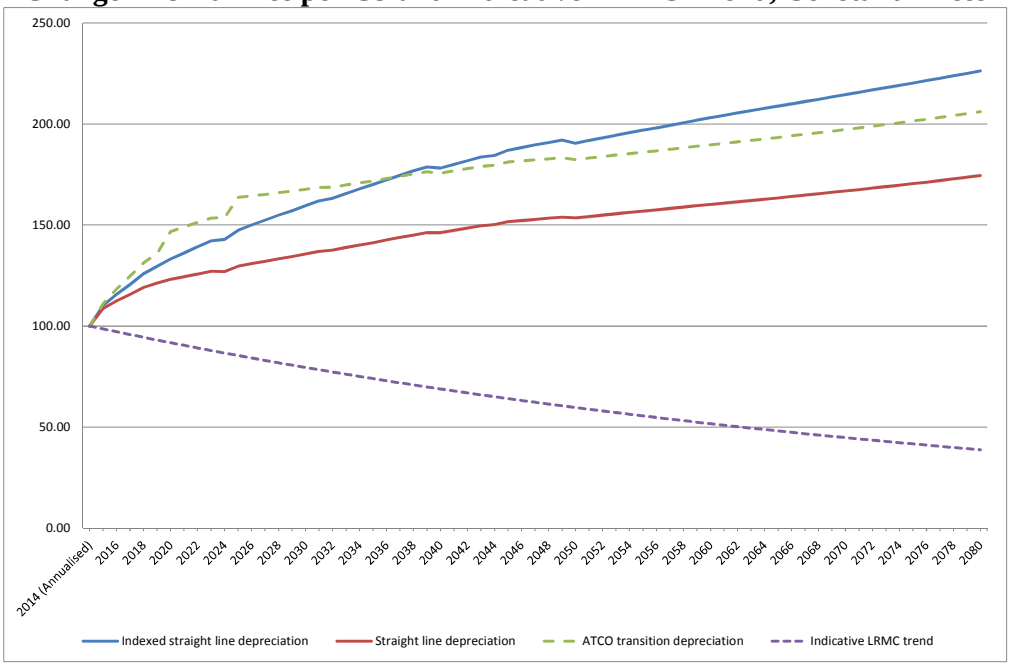
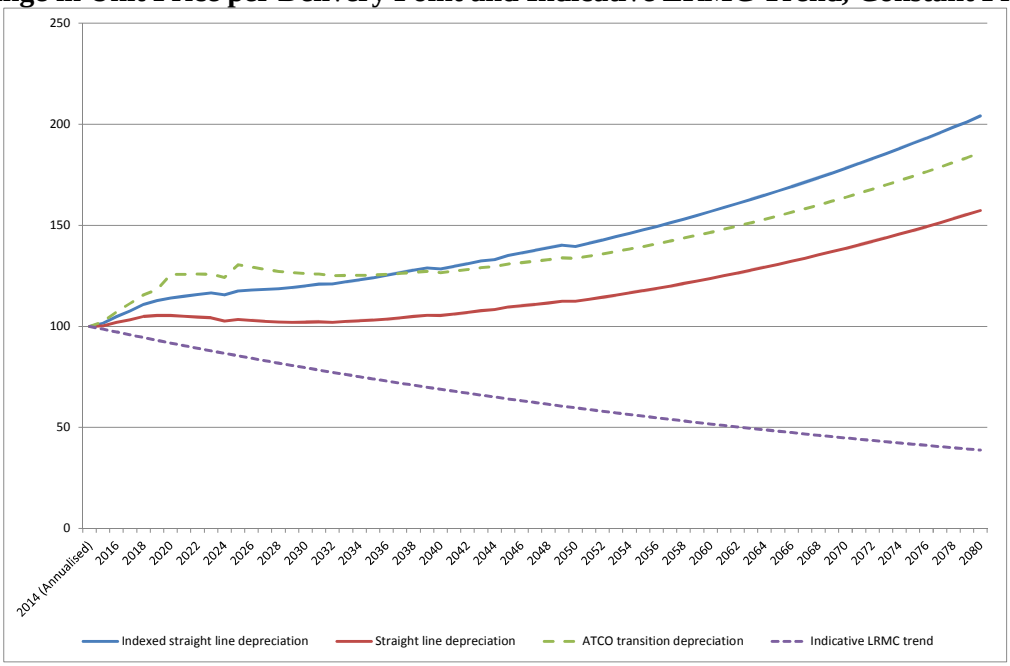


Figure 6.2
Change in Unit Price per Delivery Point and Indicative LRMC Trend, Constant Prices

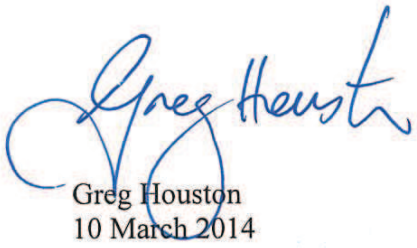


On the basis of my analysis of the likely time profile of LRMC, and of ATCO's projections of anticipated revenue per unit, I am able to rank the three depreciation methods that JWS has asked me to consider as follows:

- the use of a straight line depreciation approach together with an unindexed capital base would result in time profile of tariffs that best promotes efficient growth in the market for reference services;
- ACTO Gas's proposed transition method would better promote growth in the market for reference services, as compared with an indexed straight line depreciation approach together with an indexed capital base; and
- the indexed straight line depreciation approach together with an indexed capital base least promotes efficient growth in the market for gas distribution services.

7. Declaration

I declare that I have prepared this report in accordance with the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*". I confirm that I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from this report.



Greg Houston
10 March 2014

Appendix A. Sensitivity analysis

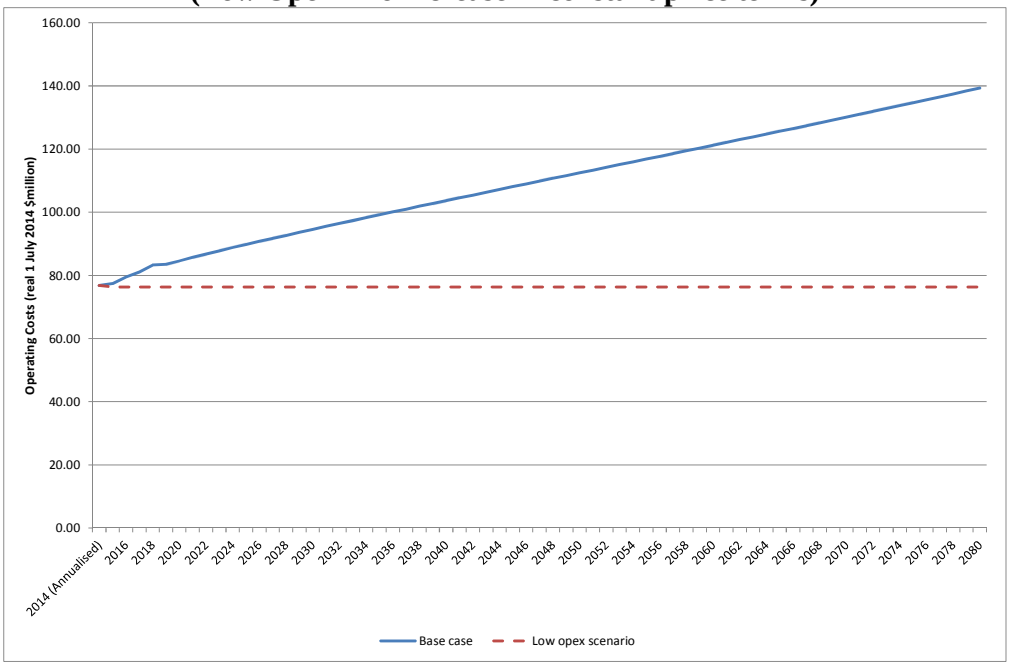
In this appendix I consider the extent to which the conclusions I draw in section 5 are sensitive to changes in ATCO Gas's input assumptions –namely, its forecasts of operating expenditure, demand and capital expenditure. In each scenario, I adopt alternative input assumptions that have the effect of reducing the future level of reference tariffs.

I find that, although in each scenario the future level of prices is lower than in the base case, the use of indexed straight line depreciation (together with an indexed capital base) nevertheless still results in the level of prices trending upward.

A.1. Low operating expenditure growth scenario

In this scenario I assume that ATCO Gas's operating costs are maintained at the same level, in constant price terms. I note that this scenario implicitly assumes substantial (and potentially unrealistic) productivity improvements, in that the number of connection points grows from around 680,000 (excluding consumers receiving prudent discounts) in the second half of 2014 to over 1.9 million connections in 2080.

Figure A.1
ATCO Gas's Operating Costs, Constant Prices
(Low Opex – no increase in constant price terms)



* 1 July to 31 December 2014 operating expenditure has been doubled to estimate annualised operating expenditure.

Figure A.2 and Figure A.3, show that, in a scenario where there is no increase in ATCO Gas's operating expenditure in constant price terms, the three depreciation methodologies nevertheless continue to result in a rise in the total revenue (in constant price terms) per unit of gas delivered as well as per connection point.

Figure A.2
Total Revenue per GJ, Constant Prices
(Low Opex – no increase in constant price terms)

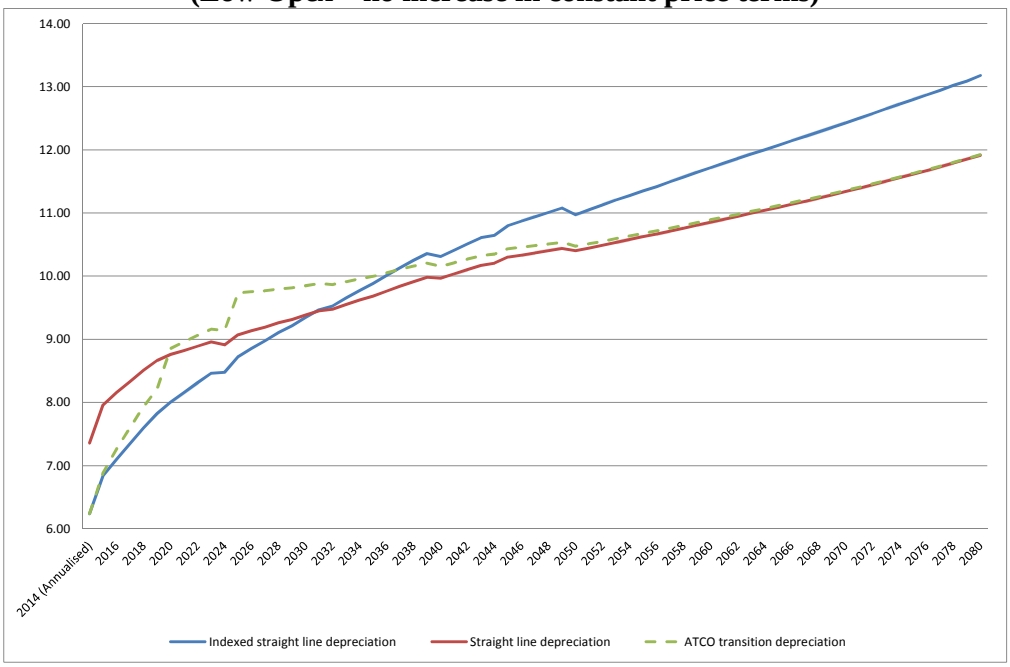
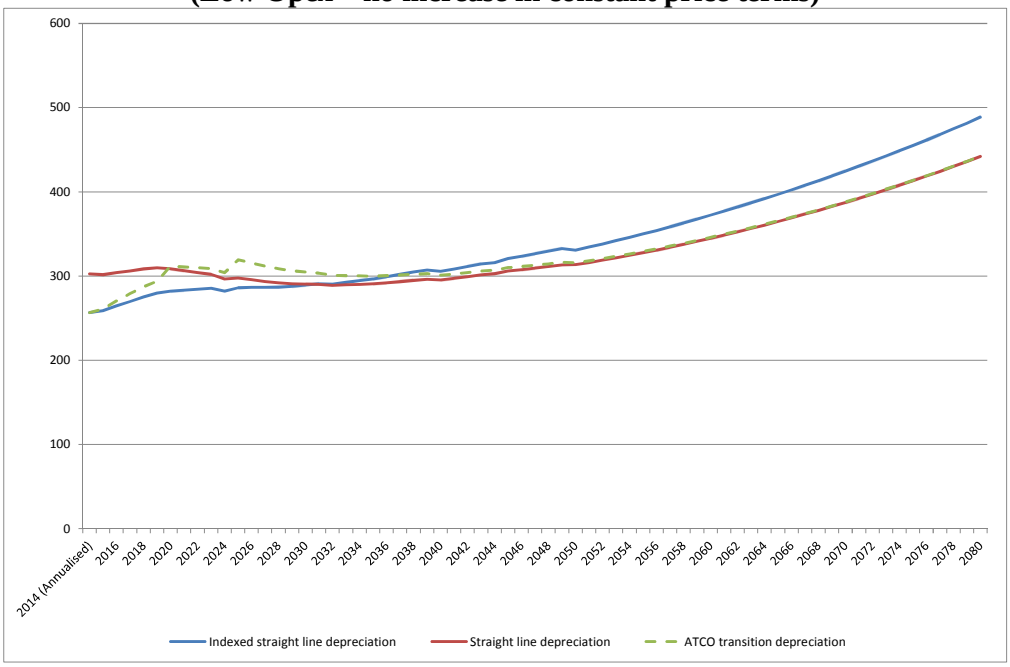


Figure A.3
Total Revenue per Delivery Point, Constant Prices
(Low Opex – no increase in constant price terms)



A.2. High growth scenario

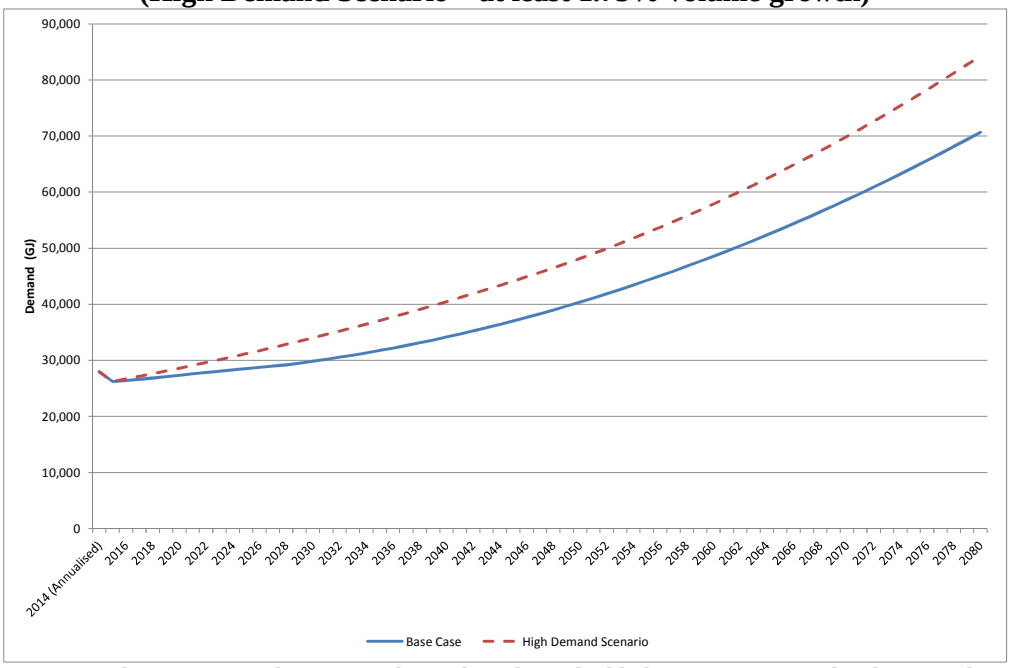
In this scenario, I assume that ATCO Gas experiences higher growth in demand for reference services, ie:

- the volume of gas delivered will increase by at least 1.75 per cent per annum; and
- the number of delivery points will increase by at least 2.0 per cent per annum.

In those years that ATCO Gas's projections assume that the growth is greater than these minimum growth rates I have adopted its own values. As a result, the number of delivery points in this modified scenario increases to 2.6 million by 2080, rather than 1.9 million, while the volume of gas delivered increases to 84 PJ by 2080, as compared with 71 PJ in the base case.

I note that, although I have increased the projected demand growth in this scenario, I have not made any corresponding adjustments to the capital expenditure requirement projected by ATCO Gas. The combination of greater demand and contant expenditure causes prices to rise by less than under ATCO Gas's base case.

Figure A.4
Volume of Gas Delivered (GJ)
(High Demand Scenario – at least 1.75% volume growth)



* 1 July to 31 December 2014 volumes have been doubled to estimate annualised 2014 volumes.

Figure A.5
Delivery Points
(High Demand Scenario – at least 2% growth)

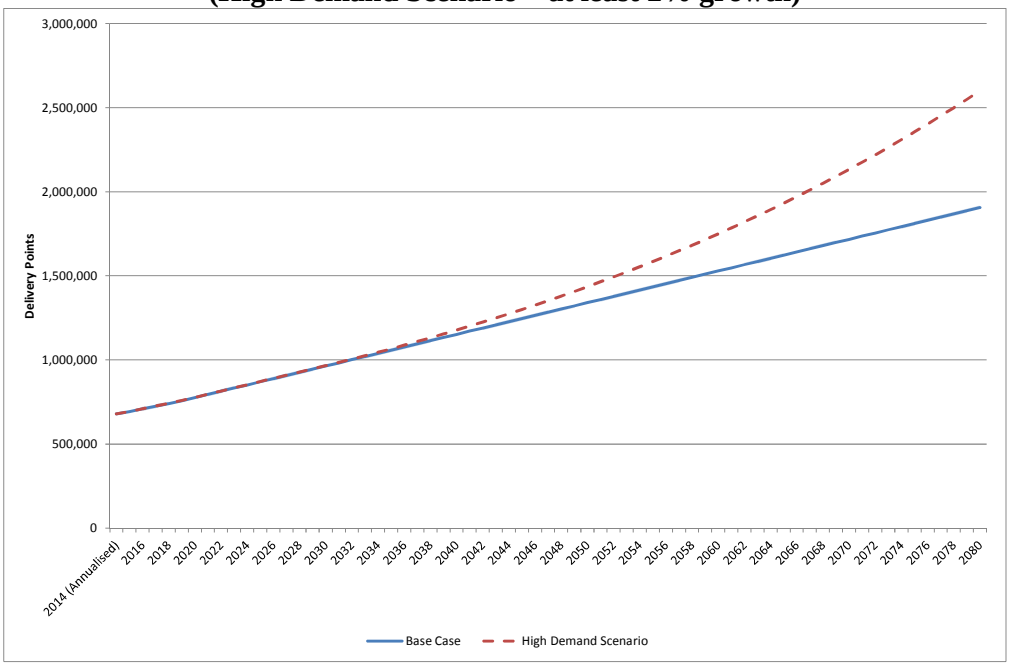


Figure A.6 and Figure A.7, show that under a scenario of higher demand for reference services, the three depreciation approaches still result in a rise in revenue (in constant price terms) per unit of gas delivered and per connection point.

Further, the indexed straight line depreciation approach, applied in conjunction with an indexed capital base, results in the greatest increase in the level of prices, while the straight line depreciation approach, together with an unindexed capital base, leads to the smallest increases.

Figure A.6
Total Revenue per GJ, Constant Prices
(High Demand Scenario – at least 1.75% growth)

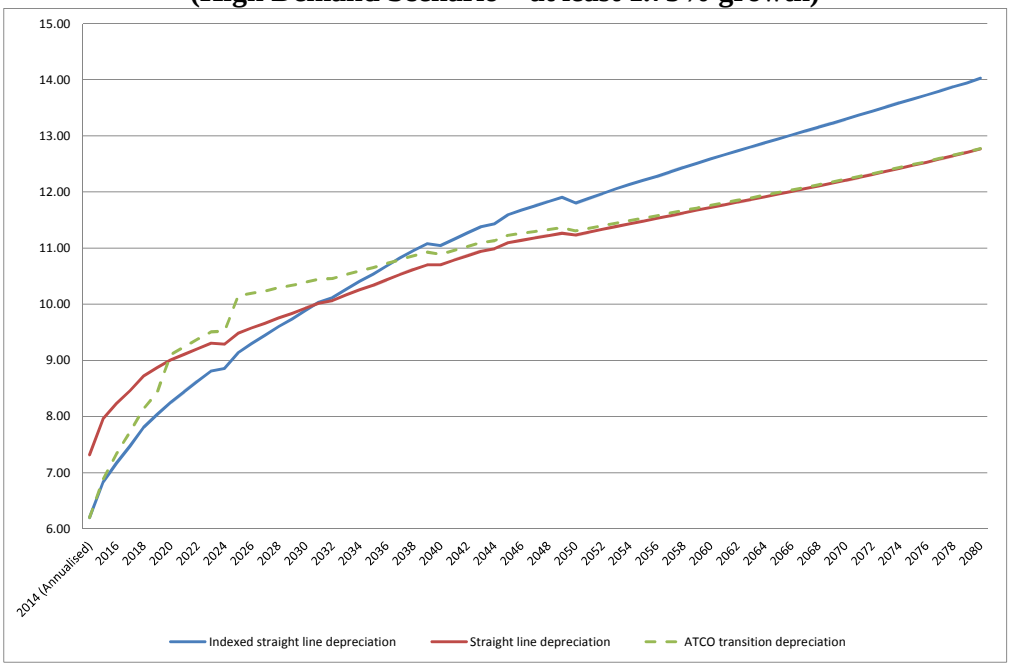
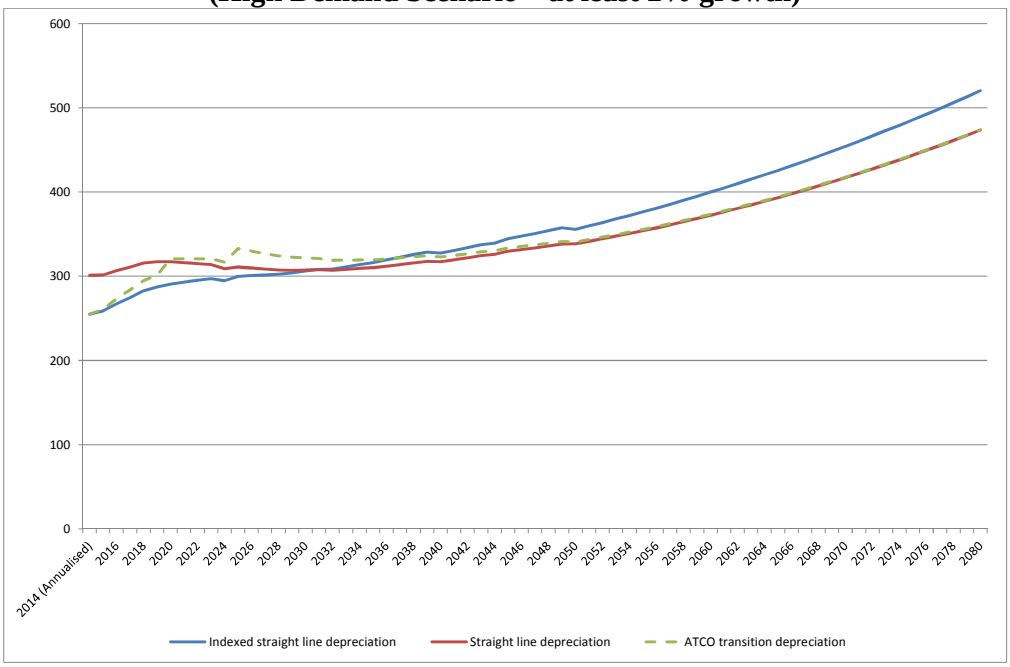


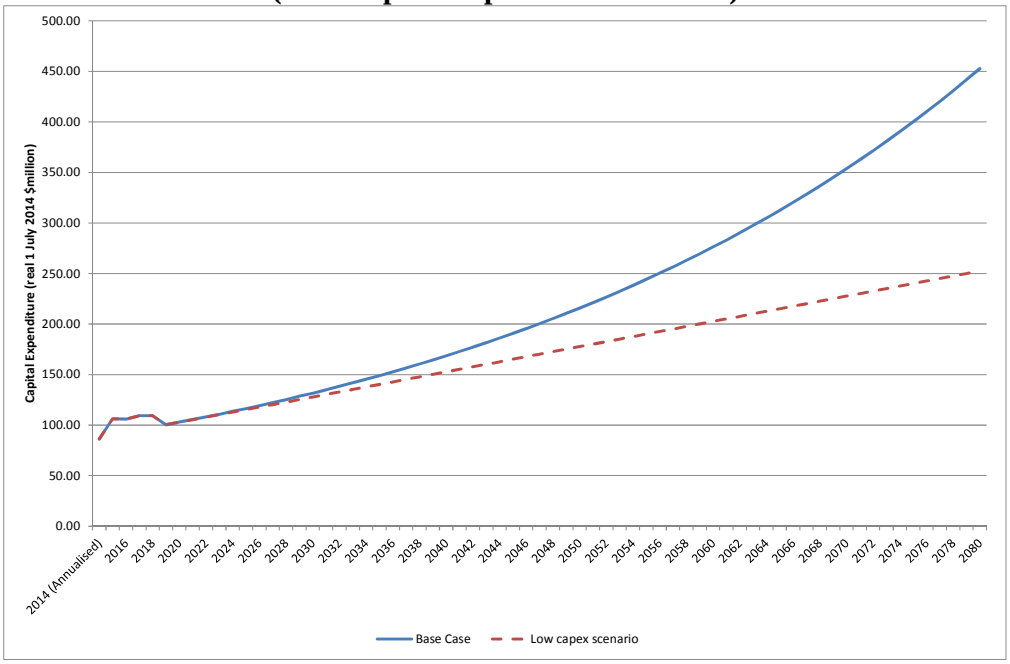
Figure A.7
Total Revenue per Delivery Point, Constant Prices
(High Demand Scenario – at least 2% growth)



A.3. Low capital expenditure scenario

In this scenario, I restrict the long term growth in capital expenditure (from 2020) to be the same as the rate of growth in delivery points for that year. In consequence, the amount of capital expenditure (in July 2014 price terms) falls from $453 million to $253 million in 2080.

Figure A.8
Capital Expenditure, Constant Prices
(Low Capital Expenditure Scenario)



* 1 July to 31 December 2014 capital expenditure has been doubled to estimate annualised 2014 capital expenditure.

Figure A.10 shows that, under this scenario the reduction in future capital expenditure results in a continuous upward trend in revenue per delivery point. Figure A.9 shows that total revenue (in constant price terms) per unit of gas delivered increases in the period up to the middle of this century, before then falling. This outcome is not unsurprising since the growth in delivery points from 2020 to 2080 is 145 per cent, as compared with a growth in volumes of 159 per cent. As a result, in this scenario the growth in volumes is assumed to outpace the growth in capex from 2020.

I note again that in this scenario each of the depreciation methodologies results in a substantial increase in the level of revenue (per unit of gas transported and per delivery point, in constant price terms), over the assessment period. Furthermore, the indexed straight line depreciation, applied in conjunction with an indexed capital base, results in the greatest increase in the level of revenue per unit (in constant price terms), whilst straight line depreciation, applied in conjunction with an unindexed capital base gives rise to the smallest increase.

Figure A.9
Total Revenue per GJ, Constant Prices
(Low Capital Expenditure Scenario)

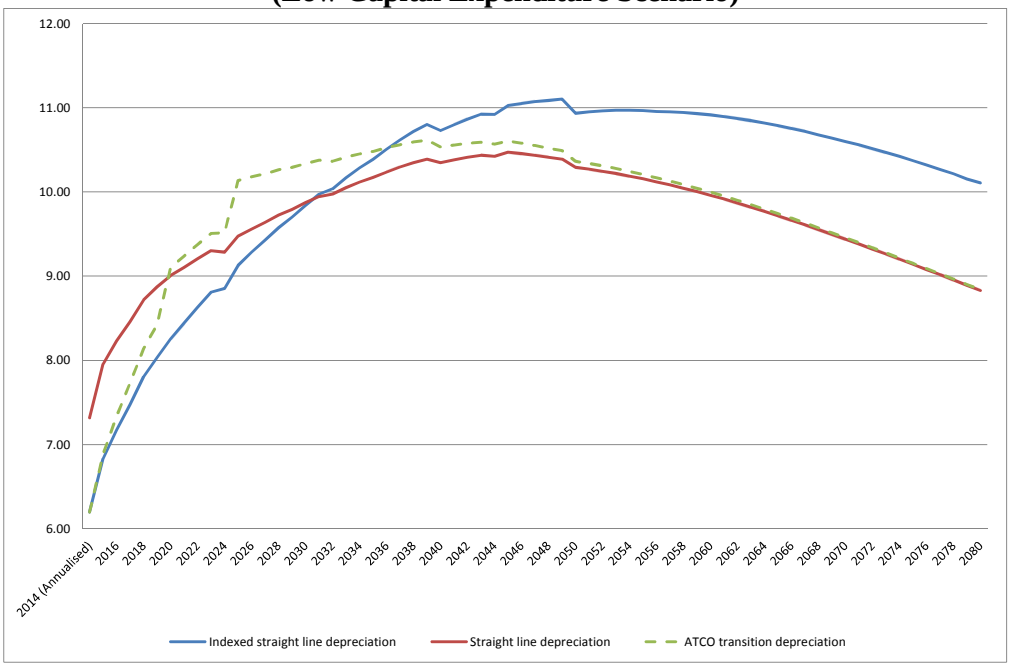
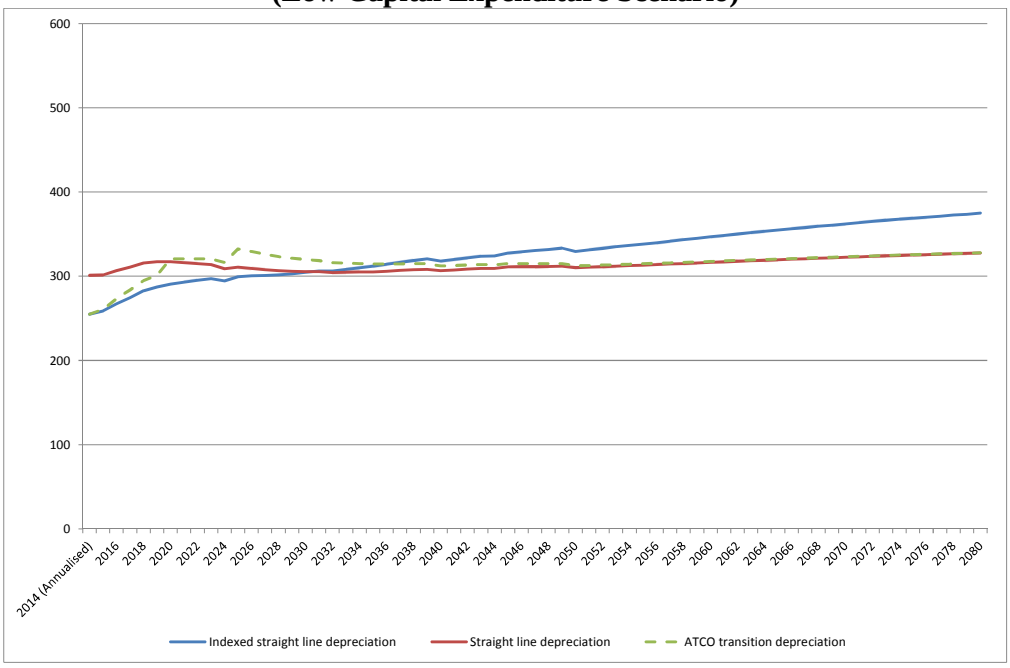


Figure A.10
Total Revenue per Delivery Point, Constant Prices
(Low Capital Expenditure Scenario)



Appendix B. ATCO Gas Time Series Data

This appendix sets out ATCO Gas's long term projections of operating expenditure, capital expenditure and tax depreciation.

Table B.1
Operating Expenditure, Capital Expenditure and Tax Depreciation

Date	Opex	Capex	Tax Depreciation
2014 (Annualised)	38.88	43.69	23.83
2015	80.34	110.13	52.13
2016	84.61	112.84	57.93
2017	88.41	119.23	59.24
2018	93.04	122.34	59.76
2019	95.63	114.98	64.41
2020	99.33	120.81	66.03
2021	103.13	126.92	70.80
2022	107.02	133.35	76.50
2023	111.01	140.10	81.92
2024	115.10	147.19	86.53
2025	119.30	154.64	91.43
2026	123.61	162.47	96.35
2027	128.03	170.69	101.41
2028	132.56	179.34	106.24
2029	137.28	188.41	110.37
2030	142.13	197.95	114.98
2031	147.13	207.97	119.52
2032	152.28	218.50	123.77
2033	157.58	229.57	127.23
2034	163.04	241.19	132.11
2035	168.66	253.40	137.06
2036	174.46	266.23	141.26
2037	180.43	279.70	145.14
2038	186.58	293.86	149.29
2039	192.92	308.74	153.82
2040	199.46	324.37	158.56
2041	206.19	340.79	163.43
2042	213.13	358.04	168.43
2043	220.28	376.17	173.57
2044	227.66	395.21	178.84
2045	235.26	415.22	184.26

Date	Opex	Capex	Tax Depreciation
2046	243.09	436.24	189.82
2047	251.17	458.33	195.53
2048	259.50	481.53	201.39
2049	268.08	505.91	207.40
2050	276.93	531.52	213.53
2051	286.06	558.42	219.88
2052	295.47	586.70	226.40
2053	305.17	616.40	233.10
2054	315.17	647.60	239.96
2055	325.48	680.39	247.00
2056	336.12	714.83	254.24
2057	347.08	751.02	261.69
2058	358.39	789.04	269.35
2059	370.05	828.99	277.21
2060	382.07	870.95	285.29
2061	394.47	915.04	293.59
2062	407.26	961.37	302.11
2063	420.44	1010.04	310.87
2064	434.04	1061.17	319.86
2065	448.06	1114.89	329.10
2066	462.52	1171.33	338.59
2067	477.44	1230.63	348.33
2068	492.82	1292.93	358.34
2069	508.68	1358.39	368.62
2070	525.03	1427.16	379.18
2071	541.90	1499.41	390.03
2072	559.30	1575.31	401.17
2073	577.25	1655.06	412.61
2074	595.75	1738.85	424.36
2075	614.84	1826.88	436.43
2076	634.52	1919.37	448.83
2077	654.82	2016.54	461.56
2078	675.76	2118.62	474.64
2079	697.35	2225.88	488.07
2080	719.62	2338.56	501.86

Annexure A. Instructions

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Email: roxanne.smith@jws.com.au
Our Ref: B1299
Your Ref:
Doc ID: 65567930.1

11 March 2014

Mr Greg Houston
Director
NERA Economic Consulting
Darling Park Tower 3
201 Sussex Street
SYDNEY NSW 2000

BY EMAIL

Dear Sir

ATCO GAS AUSTRALIA PTY LTD- ERA Price Determination

We act for ATCO Gas Australia Pty Ltd (ATCO Gas) in relation to the Economic Regulation Authority's review of the Gas Access Arrangement for ATCO Gas under the National Gas Law and Rules.

ATCO Gas owns and operates the Mid West and South West Gas Distribution System in WA. ATCO Gas wishes to engage you to prepare an expert report in connection with the ERA's review of the access arrangement for the period from 1 July 2014 to December 2019.

This letter sets out the matters which ATCO Gas wishes you to address in your report and the requirements with which the report must comply.

Terms of Reference

Legal Framework

The terms and conditions upon which ATCO Gas provides access to its gas network are subject to five yearly reviews by the ERA. The ERA undertakes that review by considering the terms and conditions proposed against criteria set out in the *National Gas Law* and *National Gas Rules*.

Rule 76 of the *National Gas Rules* provides that the total revenue for each regulatory year is determined using a building block approach, which building blocks include a return on the projected capital base and depreciation on the projected capital base.

Rule 87 provides for the determination of a rate of return on the projected capital base. The amended Rule 87 now in force requires a rate of return to be determined on a *nominal* vanilla basis. Importantly, ATCO Gas' rate of return in its previous access arrangement was calculated on a real basis.

Rule 88 provides for the establishment of a depreciation schedule for the purposes of determining the depreciation allowance and reference tariffs. Rule 89 provides that a depreciation schedule should be designed:

1(a) so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services;

Rule 89(2) says that compliance with Rule 89(1)(a) may involve deferral of a substantial portion of the depreciation, particularly in the circumstances set out in sub-paragraphs 89(2)(a) to (c).

Rule 89 is a limited discretion rule, such that if ATCO Gas' depreciation schedule proposal complies with that Rule, the ERA cannot withhold approval (Rule 40(2)).

We also refer you to Rule 94, in particular Rule 94(4) and (5) dealing with reference tariff structure.

An overarching requirement is that the ERA must, in performing or exercising its economic regulatory function or power perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national gas objective (**NGO**).

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.

Depreciation Method

We are instructed that the regulatory practice has been for the depreciation building block to be calculated using either indexed (real) or unindexed (nominal) values for the asset base, impacting on the quantum of the depreciation allowance. We note that there is no requirement in the National Gas Rules that the regulatory asset base be indexed.

In ATCO Gas' previous access arrangement, the opening and projected capital bases were indexed and a real rate of return used. While a nominal rate of return has previously been used in other jurisdictions, ATCO Gas has only ever had its rate of return determined on a real basis.

However, the change to a nominal rate of return in Rule 87 requires inflation to be dealt with in the rate of return. If the nominal rate of return was now applied to an inflated capital base, there would be a double counting of inflation.

We are instructed that there are two (and possibly more) approaches to deal with this:

1. Inflate the capital base but back the inflation out of depreciation to avoid the double counting. This has been the approach historically taken by the AER using the Post Tax Revenue Model. It is also the approach the ERA proposes to take.. The effect of this approach is to smooth out or defer revenues as recovery of depreciation is deferred to later periods.

2. Do not inflate the capital base (the historical cost accounting or HCA approach) and apply straight line depreciation. The effect of this approach is higher initial overall revenue which decreases over time. Given the change in approach, the application of the HCA method in this access arrangement period would result in a short- term price increase, with higher initial overall revenue then a decreasing tariff profile.

The Rules do not specifically provide for any particular approach to be used.

The APA GasNet decision

In late 2013 APA GasNet sought review in the Tribunal of the AER's decision rejecting its proposal to move to a HCA approach. The AER rejected APA Gasnet's proposal because it considered it did not meet the requirements of Rule 89(1)(a) as the impact of the APA approach would be to promote inefficient growth of the market, given the higher prices early in the asset life.

The Tribunal found that no error had been made out in respect of the AER's rejection of the HCA approach and application of its CCA approach. A copy of the Tribunal decision is attached.

The following are key findings from the Tribunal decision:

- It is clear from Rule 89 that various methods of depreciation could potentially be used in the determination of reference tariffs. There is no method specified as a default or standard approach. Rather, all that is required is that any depreciation approach that is proposed satisfies the criteria in sub-rule(1).[1]
- The AER did not misunderstand or misapply the Rule when it determined that APA's proposal would lead to tariffs varying over time in a way that promotes inefficient growth in the market.[2] The AER reached three primary conclusions in this regard:
    - Efficient growth ordinarily requires variations in tariffs to reflect variations in costs in the short to medium term. APA GasNet's costs had fallen (in particular cost of capital and in the capital base) and it was not efficient to try and use the depreciation methodology to insulate customers from cost reductions. Tariffs that do not reflect changes in forecast cost do not send efficient signals for asset utilisation.
    - APA GasNet submitted that capacity constraints in certain areas meant lower tariffs would stimulate demand, putting further pressure on capacity and in turn resulting in a requirement for more funds for capital investment. It submitted the AER approach would result in inefficiencies because investment in those areas in response to higher demand would result in an increase in the capital base and therefore tariffs, throttling demand and giving rise to a risk of underutilised assets.[3] The AER rejected this argument and found that the capacity constraints identified by APA were insufficient to justify a change in depreciation approach.
    - The AER's method was consistent with Rule 89(1)(e) as it allowed for APA GasNet's reasonable needs for cashflow.

[1] Paragraph 175
[2] Paragraph 196
[3] Paragraph 205.

- The Tribunal found that the AER did not err in making these findings and did not misunderstand its task under the limited discretion rule.
- The Tribunal observed that the change of depreciation approach did not target the area of capacity constraint and was a disproportionate response to the potential capacity problem.[4]
- There was general agreement between experts as to what is required in terms of tariff paths to promote efficient growth in the market for reference services; subject to tariffs reflecting long-run marginal cost, recovery of any remaining costs should be so as to minimise distortion of demand.[5]
- The AER did not make any reviewable error in finding that the HCA proposal by APA GasNet did not meet the requirements of Rule 89(1)(a) and its CCA method did, given the declining cost profile of APA.

What can be drawn from this decision is that the question of whether a HCA, CCA or some other approach to depreciation is used is open. The relevant test will be whether the tariff profile that results from the application of the method, in the particular circumstances of the service provider, meets the test in Rule 89(1)(a) and consequently the NGO.

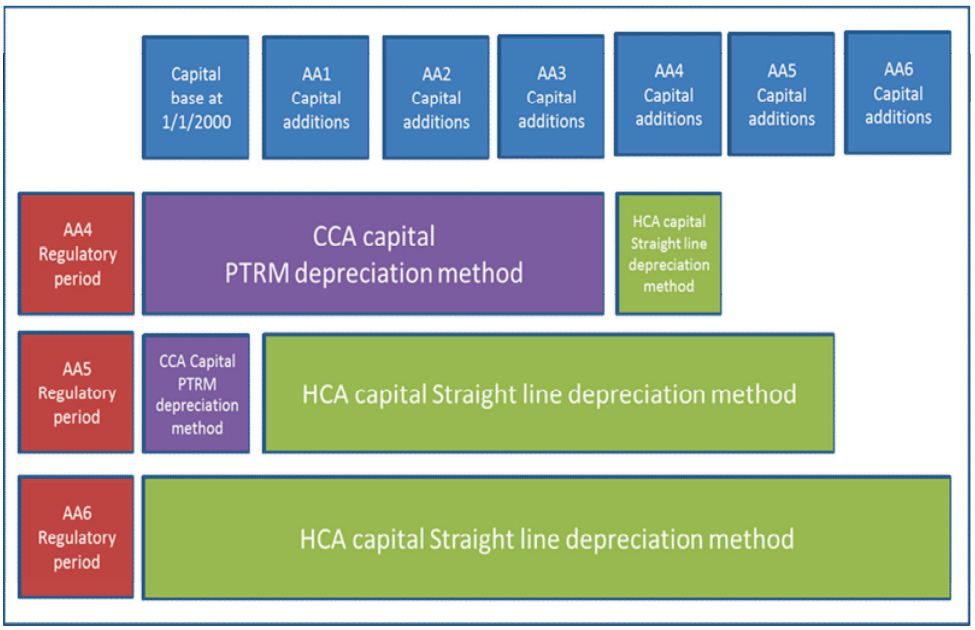
In preparing your report, please read in detail the APA GasNet decision enclosed.

ATCO Gas Australia's proposal- transitional approach

In its access arrangement proposal, ATCO Gas Australia proposes to apply an unindexed, historical cost accounting approach to all new capital post 1 July 2014 and apply the straight line method to forecast depreciation. However, recognising the change in approach, ATCO Gas Australia is proposing to transition progressively to this approach over more than one regulatory period.

ATCO Gas Australia will continue to apply inflation to the opening capital base (the current cost accounting method) and apply the PTRM method of depreciation (that is the method that calculates straight line depreciation on an inflated capital base and then subtracts the inflation component). ATCO Gas Australia is proposing that the full transition to the unindexed approach be in place for the regulatory period commending 1 January 2025 (AA6). The following diagram sets out the proposed transition to an unindexed asset base approach (**the transitional proposal**).

[4] Paragraph 214
[5] Paragraph 218



Opinion

In this context ATCO Gas wishes to engage you to prepare an expert report which addresses the following:

1. An explanation of the economic function of Rule 89, particularly 89(1)(a) and the related 89(2) and the relationship with Rule 94 (if any), and their relationship with the national gas objective (NGO).
2. In your opinion, and having regard to the decision of the Tribunal in *APA GasNet*, what does it mean for a depreciation schedule to be designed so that reference tariffs vary over time '*in a way that promotes efficient growth in the market for reference services*" (Rule 89(1)(a)). How should that Rule be interpreted, from an economic expert point of view?
3. Based on your opinion on what is required to meet Rule 89(1)(a), which of the following approaches best meets the requirements of that rule;
    (a) an approach where the regulatory asset base is not indexed and straight line depreciation is applied; or
    (b) the transitional approach proposed by ATCO Gas Australia; or
    (c) the approach used by the AER and proposed by the ERA where the asset base is indexed and inflation removed from the depreciation allowance using the PTRM.

Use of Report

It is intended that your report will be submitted by ATCO Gas to the ERA with its Access Arrangement Proposal. The report may be provided by the ERA to its own advisers. The report must be expressed so that it may be relied upon both by ATCO Gas and by the ERA.

The ERA may ask queries in respect of the report and you will be required to assist in answering these queries. The ERA may choose to interview you and if so, you will be required to participate in any such interviews.

The report will be reviewed by ATCO Gas' legal advisers and will be used by them to provide legal advice as to its respective rights and obligations under the *National Gas Law* and *National Gas Rules*.

If ATCO Gas was to challenge any decision ultimately made by the ERA, that appeal will be made to the Australian Competition Tribunal and your report will be considered by the Tribunal. ATCO Gas may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the ERA and ATCO Gas Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

Timeframe

ATCO Gas's Access Arrangement proposal must be submitted by ***17 March 2014.*** Your report will need to be finalised by early March 2014.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by the Gas Businesses.

In particular, your report prepared for the Gas Businesses should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration 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 report".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with ATCO Gas. You should forward ATCO Gas any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and return it to us to confirm your acceptance of the engagement.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

……
Signed and acknowledged by Greg Houston

Date ……..

Annexure B. Curriculum Vitae

Gregory Houston

Director

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Overview

Greg Houston has twenty five years' experience in the economic analysis of markets and the provision of expert advice in litigation, business strategy, and policy contexts. His career as a consulting economist was preceded by periods working in a financial institution and for government.

Greg has directed a wide range of competition, regulatory and financial economics assignments since joining NERA in 1989. His work in the Asia Pacific region principally revolves around the activities of the enforcement and regulatory agencies responsible for these areas, many of whom also number amongst his clients. In his securities and finance work Greg has advised clients on a number of securities class action, market manipulation and insider trading proceedings, as well as on cost of capital estimation. On competition and antitrust matters he has advised clients on merger clearance processes, competition proceedings involving allegations of anticompetitive conduct ranging from predatory pricing, anti-competitive agreements, anti-competitive bundling and price fixing. Greg also has deep experience of infrastructure access regulation matters, and intellectual property and damages valuation.

Greg's industry experience spans the aviation, beverages, building products, cement, e-commerce, electricity and gas, forest products, grains, medical waste, mining, payments networks, petroleum, ports, rail transport, retailing, scrap metal, securities markets, steel, telecommunications, thoroughbred racing, waste processing and water sectors.

Greg has acted as expert witness in valuation, antitrust and regulatory proceedings before the courts, in various arbitration and mediation processes, and before regulatory and judicial bodies in Australia, Fiji, New Zealand, the Philippines, Singapore, the United Kingdom and the United States.

Greg serves on the Competition and Consumer Committee of the Law Council of Australia, and is head of NERA's Australian operations.

Qualifications

1982 **UNIVERSITY OF CANTERBURY, NEW ZEALAND**
B.Sc. (First Class Honours) in Economics

Prizes and Scholarships

1980 University Junior Scholarship, New Zealand

Career Details

1987-89 **HAMBROS BANK, TREASURY AND CAPITAL MARKETS**
Financial Economist, London, United Kingdom

1983-86 **THE TREASURY, FINANCE SECTOR POLICY**
Investigating Officer, Wellington, New Zealand

Project Experience

Regulatory Analysis

2013 **Actew Corporation**
Interpretation of economic terms
Advice on economic aspects of the draft and final decisions of the Independent Competition and Regulatory Commission in relation to the price controls applying to Actew.

2012-13 **Gilbert + Tobin/Rio Tinto Coal Australia**
Price review arbitration
Analysis and expert reports prepared in the context of an arbitration concerning the price to be charged for use of the coal loading facilities at Abbott Point Coal Terminal.

2012-13 **Ashurst/Brisbane Airport Corporation**
Draft access undertaking
Advice, analysis and expert reports in the context of the preparation of a draft access undertaking specifying the basis for determining a ten year price path for landing charges necessary to finance a new parallel runway at Brisbane airport.

2012 **King & Wood Mallesons/Origin Energy**
Interpretation of economic terms
Expert reports and testimony in the context of judicial review proceedings before the Supreme Court of Queensland on the electricity retail price determination of the Queensland Competition Authority.

2012	**Contact Energy, New Zealand** **Transmission pricing methodology** Advice on reforms to the Transmission Pricing Methodology proposed by Electricity Authority.
2011-12	**Energy Networks Association** **Network pricing rules** Advice and expert reports submitted to the Australian Energy Market Commission on wide-ranging reforms to the network pricing rules applying to electricity and gas transmission and distribution businesses, as proposed by the Australian Energy Regulator.
2010-12	**QR National** **Regulatory and competition matters** Advisor on the competition and regulatory matters, including: a range of potential structural options arising in the context of the privatisation of QR National's coal and freight haulage businesses, particularly those arising in the context of a 'club ownership model' proposed by a group of major coal mine owners; and an assessment of competitive implications of proposed reforms to access charges for use of the electrified network.
2002-12	**Orion New Zealand Ltd, New Zealand** **Electricity lines regulation** Advisor on regulatory and economic aspects of the implementation by the Commerce Commission of the evolving regimes for the regulation of New Zealand electricity lines businesses. This role has included assistance with the drafting submissions, the provision of expert reports, and the giving of expert evidence before the Commerce Commission.
2011	**Meridian Energy, New Zealand** **Undesirable trading situation** Advice to Meridian Energy on the economic interpretation and implications of the New Zealand electricity rule provisions that define an 'undesirable trading situation' in the wholesale electricity market.
2011	**Ausgrid** **Demand side management** Prepared a report on incentives, constraints and options for reform of the regulatory arrangements governing the role of demand side management in electricity markets.

2010-11	**Transnet Corporation, South Africa** **Regulatory and competition policy** Retained to advise on the preparation of a white paper on future policy and institutional reforms to the competitive and regulatory environment applying to the ports, rail and oil and gas pipeline sectors of South Africa.
2010-11	**Minter Ellison/UNELCO, Vanuatu** **Arbitral review of decision by the Vanuatu regulator** Expert report and evidence before arbitrators on a range of matters arising from the Vanuatu regulator's decision on the base price to apply under four electricity concession contracts entered into by UNELCO and the Vanuatu government. These included the estimation of the allowed rate of return including its country risk component, and the decision retrospectively to bring to account events from the prior regulatory period.
2007-11	**Powerco/CitiPower** **Regulatory advice** Wide ranging advice on matters arising under the national electricity law and rules, such as the framework for reviewing electricity distribution price caps, the treatment of related party outsourcing arrangements, an expert report on application of the AER's efficiency benefit sharing scheme, the potential application of total factor productivity measures in CPI-X regulation, and arrangements for the state-wide roll out of advanced metering infrastructure.
1999-2004, 2010-11	**Sydney Airports Corporation** **Aeronautical pricing notification** Wide ranging advice on regulatory matters. This includes advice and expert reports in relation to SACL's notification to the ACCC of substantial reforms to aeronautical charges at Sydney Airport in 2001. This involved the analysis and presentation of pricing principles and their detailed application, through to discussion of such matters at SACL's board, with the ACCC, and in public consultation forums. Subsequent advice on two Productivity Commission reviews of airport charging, and notifications to the ACCC on revised charges for regional airlines.
2010	**Industry Funds Management/Queensland Investment Corporation** **Due diligence, Port of Brisbane** Retained to advise on regulatory and competition matters likely to affect the future financial and business performance of the Port of Brisbane, in the context of its sale by the Queensland government.

2009-10	**New Zealand Electricity Industry Working Group, New Zealand** **Transmission pricing project** Advice to a working group comprising representatives from lines companies, generators, major users and Transpower on potential improvements to the efficiency of New Zealand's electricity transmission pricing arrangements.
2007-09	**GDSE, Macau** **Electricity tariff reform** Advice to the regulator of electricity tariffs in Macau on a series of potential reforms to the structure of electricity supply tariffs.
2001-09	**Auckland International Airport Limited, New Zealand** **Aeronautical price regulation** Advice and various expert reports in relation to: the review by the Commerce Commission of the case for introducing price control at Auckland airport; a fundamental review of airport charges implemented in 2007; and the modified provisions of Part IV of the Commerce Act concerning the economic regulation of airports and other infrastructure service providers.
2008	**Western Power** **Optimal treatment and application of capital contributions** Advice on the optimal regulatory treatment of capital contributions, taking into account the effect of alternative approaches on tariffs, regulatory asset values, and network connection by new customers.
2000-08	**TransGrid** **National electricity market and revenue cap reset** Regulatory advisor to TransGrid on a range of issues arising in the context of the national electricity market (NEM), including: the economics of transmission pricing and investment and its integration with the wholesale energy market, regulatory asset valuation, the cost of capital and TransGrid's 2004 revenue cap reset by the ACCC.
2007	**Johnson Winter & Slattery/Multinet** **Review of outsourced asset management contracts** Expert report developing a framework for assessing the prudence of outsourcing contracts in the context of the Gas Code, and evaluating the arrangements between Multinet and Alinta Asset Management by reference to that framework.
2007	**Ministerial Council on Energy** **Review of Chapter 5 of the National Electricity Rules** Advice on the development of a national framework for connection applications and capital contributions in the context of the National Electricity Rules.

2006-07	**Ministerial Council on Energy** **Demand side response and distributed generation incentives** Conducted a review of the MCE's proposed initial national electricity distribution network revenue and pricing rules to identify the implications for the efficient use of demand side response and distributed generation by electricity network owners and customers.
2006	**Ministerial Council on Energy** **Electricity network pricing rules** Advice on the framework for the development of the initial national electricity distribution network pricing rules, in the context of the transition to a single, national economic regulator.
2005-06	**Minister for Industry** **Expert Panel** Appointment by Hon Ian Macfarlane, Minister for Industry, Tourism and Resources, to an Expert Panel to advise the Ministerial Council on Energy on achieving harmonisation of the approach to regulation of electricity and gas transmission and distribution infrastructure.
2005-06	**Australian Energy Markets Commission** **Transmission pricing regime** Advice to the AEMC on its review of the transmission revenue and pricing rules as required by the new National Electricity Law.
1998-2006	**Essential Services Commission of Victoria** **Price cap reviews** Wide ranging advice to the Essential Services Commission (formerly the Office of the Regulator-General), on regulatory, financial and strategic issues arising in the context of five separate reviews of price controls/access arrangements applying in the electricity, gas distribution, ports, rail and water sectors in Victoria. This work encompassed advice on the development of the Commission's work program and public consultation strategy for each review, direct assistance with the drafting of papers for public consultation, the provision of internal papers and analysis on specific aspects of the review, drafting of decision documents, and acting as expert witness in hearings before the Appeal Panel and Victorian Supreme Court.
2004-05	**Ministerial Council of Energy** **Reform of the National Electricity Law** Retained in two separate advisory roles in relation to the reform of the institutions and legal framework underpinning the national energy markets. These roles include the appropriate specification of the objectives and rule making test for the national electricity market, and the development of a harmonised framework for distribution and retail regulation.

2004-05 **Johnson Winter Slattery, ETSA Utilities**
Price determination
Advice on a wide range of economic and financial issues in the context of ETSA Utilities' application for review of ESCOSA's determination of a five year electricity distribution price cap.

2004 **Deacons/ACCC**
Implementation of DORC valuation
Prepared a report on the implementation of a cost-based DORC valuation, for submission to the Australian Competition Tribunal in connection with proceedings on the appropriate gas transportation tariffs for the Moomba to Sydney gas pipeline.

2003-04 **Natural Gas Corporation, New Zealand**
Gas pipeline regulation
Advisor in relation to the inquiry by the Commerce Commission into the case for formal economic regulation of gas pipelines. This role included assistance with the drafting of submissions, the provision of expert reports, and the giving of evidence before the Commerce Commission.

2001-03 **Rail Infrastructure Corporation**
Preparation of access undertaking
Advised on all economic aspects arising in the preparation of an access undertaking for the New South Wales rail network. Issues arising included: pricing principles under a `negotiate and arbitrate' framework, asset valuation, efficient costs, capacity allocation and trading, and cost of capital.

2002 **Clayton Utz/TransGrid**
National Electricity Tribunal hearing
Retained as the principal economic expert in the appeal brought by Murraylink Transmission Company of NEMMCO's decision that TransGrid's proposed South Australia to New South Wales Electricity Interconnector was justified under the national electricity code's 'regulatory test'.

2001-02 **SPI PowerNet**
Revenue cap reset
Advisor on all regulatory and economic aspects of SPI PowerNet's application to the ACCC for review of its revenue cap applying from January 2003. This included assistance on regulatory strategy, asset valuation in the context of the transitional provisions of the national electricity code, drafting and editorial support for the application document, and the conduct of a `devil's advocate' review.

2002 **Corrs Chambers Westgarth/Ofgar**
Economic interpretation of the gas code
Provision of expert report and sworn testimony in the matter of Epic Energy v Office of the Independent Gas Access Regulator, before the Supreme Court of Western Australia, on the economic interpretation of certain phrases in the natural gas pipelines access code.

Securities and Finance

2013 **Sydney Water Corporation**
Cost of capital estimation
Preparation of two expert reports for submission to the Independent Pricing and regulatory Tribunal (IPART) on the framework for determining the weighted average cost of capital for infrastructure service providers.

2011-13 **Slater & Gordon/Modtech**
Shareholder damages assessment
Expert reports and testimony in representative proceedings before the Federal Court alleging misstatement and/or breach of the continuous disclosure obligations of the ASX-listed entity, GPT.

2012-13 **HWL Ebsworth/Confidential client**
Insider trading
Expert advice and analysis in the context of criminal proceedings alleging insider trading in certain ASX-listed securities.

2011-12 **Freehills/National Australia Bank**
Shareholder damages assessment
Expert advice in connection with representative proceedings before the Federal Court alleging misstatement and/or breach of the continuous disclosure obligations of an ASX-listed entity.

2012 **Johnson Winter & Slattery/Victorian gas distributors**
Cost of equity estimation
Expert report submitted to the Australia Energy Regulator on the appropriate methodology for estimating the cost of equity under the Capital Asset Pricing Model.

2009-13 **Minter Ellison/Confidential client**
Misleading and deceptive conduct
Expert report and related advice in light of investor claims and pending litigation following the freezing of withdrawals from a fixed interest investment trust that primarily held US-denominated collateralised debt obligations (CDOs), as offered by a major Australian financial institution. Analysis undertaken includes the extent to which the investment risks were adequately described in the fund documents, and the quantum of any potential damages arising.

2011 **Barringer Leather/Confidential client**
Market manipulation
Expert report prepared in the context of criminal proceedings brought in the Supreme Court of NSW alleging market manipulation in the trading of certain ASX-listed securities.

2010-11	**Wotton Kearney/Confidential client** **Misleading and deceptive conduct** Expert report and analysis in light of investor claims and pending litigation following the freezing of withdrawals from two fixed interest investment trusts that primarily held US-denominated collateralised debt obligations (CDOs).
2010-11	**Maurice Blackburn/Confidential client** **Shareholder damages assessment** Analysis prepare for use in connection with representative proceedings before the Federal Court alleging misstatement and/or breach of the continuous disclosure obligations of an ASX-listed entity.
2010-11	**Mallesons/ActewAGL** **Judicial review of rate of return determination** Expert report and testimony in Federal Court proceedings seeking judicial review of a decision by the Australian Energy Regulator of its determination of the risk free rate of interest in its price setting determination for electricity distribution services.
2009-11	**William Roberts/Clime Capital** **Shareholder damages assessment** Preparation of two expert reports in representative proceedings before the Federal Court alleging misstatement and/or breach of the continuous disclosure obligations of ASX-listed entity, Credit Corp.
2009	**Jemena Limited** **Cost of equity estimation** Co-authored an expert report on the application of a domestic Fama-French three-factor model to estimate the cost of equity for regulated gas distribution businesses.
2008-09	**Clayton Utz/Fortescue Metals Group** **Materiality of share price response** Preparation of expert report and testimony before the Federal Court addressing alleged breaches of the ASX continuous disclosure obligations and the associated effect on the price of FMG securities arising from statements made by it in 2004.
2008-09	**Energy Trade Associations – APIA, ENA and Grid Australia** **Value of tax imputation credits** Preparation of expert report on the value to investors in Australian equities of tax imputation credits, for submission to the Australian Energy Regulator.

2008-09	**Freehills/Centro Properties** **Shareholder damages assessment** Assistance in the estimation of potential damages arising in representative proceedings concerning accounting misstatements and/or breach of the continuous disclosure obligations of an ASX-listed entity.
2008	**Slater & Gordon/Boyd** **Shareholder damages assessment** Preparation of an expert report for submission to a mediation on the damages arising in representative proceedings before the Federal Court alleging accounting misstatements and/or breach of the continuous disclosure obligations of EDI Downer.
2007-08	**Maurice Blackburn/Watson** **Shareholder damages assessment** Preparation of advice estimating the damages arising in representative proceedings before the Federal Court alleging accounting misstatements and/or breach of the continuous disclosure obligation by the ASX-listed entity, AWB Limited.
2007	**Freehills/Telstra Corporation** **Shareholder damages assessment** Advice and assistance in the preparation of the expert report of Dr Fred Dunbar submitted to the Federal Court in the context of proceedings alleging breaches of the continuous disclosure obligations by Telstra. The principal subject of this work was the assessment of the extent to which of material alleged not to have been disclosed was already known and incorporated in Telstra's stock price.
2006-07	**Maurice Blackburn/Dorajay** **Shareholder damages assessment** Advice and assistance in the preparation of the expert report of Dr Fred Dunbar submitted to the Federal Court in the context of proceedings between Dorojay and Aristocrat Leisure. The principal subject of this work was the assessment of the extent and duration of share price inflation arising from various accounting misstatements and alleged breaches of the continuous disclosure obligations.

Valuation and Contract Analysis

2013 **Johnson Winter & Slattery/Origin**
Gas supply agreement price review
Analysis and advice on the implications of certain contract terms for the price of gas, to be determined in a potential arbitration concerning the terms of a substantial long term gas supply agreement.

2013 **Herbert Smith Freehills/Santos**
Gas supply agreement price review
Analysis and advice on factors influencing the market price of gas in eastern Australia, to be determined in a potential arbitration concerning the terms of a substantial long term gas supply agreement.

2012-13 **Herbert Smith Freehills/North West Shelf Gas**
Gas supply agreement arbitration
Expert reports on the implications of certain contract terms for the price of gas under a substantial long term gas supply agreement.

2012-13 **Allens/BHP Billiton-Esso**
Gas supply agreement arbitration
Analysis, advice and expert report on the implications of certain contract terms for the price of gas under a substantial long term gas supply agreement.

2012 **King & Wood Mallesons/Ausgrid**
Power purchase agreement arbitration
Expert report prepared and filed in an arbitration on the in relation to the effect of the government's newly introduced carbon pricing mechanism on the price to be paid under a long term power purchase and hedge agreement between an electricity generator and retailer.

2011 **Kelly & Co/Cooper Basin Producers**
Wharfage dues agreement arbitration
Expert report and testimony in arbitration proceedings to determine the 'normal wharfage dues' to be paid for use of a facility that assists the transfer of petroleum products to tanker ships from a processing terminal in South Australia.

2010 **Barclays Capital/Confidential Client**
Due diligence, Alinta Energy
Retained to advise on the key industry related risks and issues facing Alinta Energy's gas and electricity assets during the due diligence process associated with its recapitalisation and sale.

2009 **Freehills/Santos**
Gas supply agreement price review
Analysis and advice on factors influencing the market price of gas in eastern Australia, to be determined in a potential arbitration concerning the terms of a substantial long term gas supply agreement.

2008-09	**Clayton Utz/Origin Energy** **Gas supply agreement arbitration** Expert reports and testimony in an arbitration concerning the market price of gas, which was determined and applied in a substantial long term gas supply agreement.
2008-09	**Minter Ellison/Confidential client** **Treatment of past capital contributions** Expert report and evidence given in arbitration proceedings on the extent to which a discount should apply under a long term water supply contract, in recognition of a capital contribution made at the outset of the agreement.
2008	**Freehills/Tenix Toll** **Logistics contract arbitration** Advice on the appropriate methodology for adjusting prices under a long term logistics contract in light of changing fuel costs.
2008	**BG plc** **Market analysis** Advise on economic aspects of the operation of the east Australian wholesale gas market in the context of the potential development of coal seam gas for use in LNG production and export.
2008	**Gilbert + Tobin/Waste Services NSW** **Damages estimation** Damages assessment in the context of a Federal Court finding of misleading and deceptive conduct in relation to the extent of environmental compliance in the provision of waste services.
2007	**Meerkin & Apel/SteriCorp** **Damages assessment** Expert report and testimony in the context of an international arbitration on commercial damages arising from alleged non-performance of a medical waste processing plant.
2006-07	**Middletons/Confidential Client** **Damages assessment** Retained to provide an expert report on the methodological framework for assessing alleged damages arising from contractual non-performance and associated forecast for demand and supply conditions and prices for natural gas and ethane prices and over a ten year period.

2006 **Confidential Client/Australia**
Valuation of digital copyright
Advice in relation to the negotiation for a licence for digital copyright. This included the discussion of the matters that should be considered in determining fees for a digital copyright licence, including the extent to which digital material should be valued differently from print material and whether the charging mechanism for print is appropriate for digital copyright.

2006 **Minter Ellison/Australian Hotels Association**
Valuation of copyright material
Expert report in the context of proceedings before the Copyright Tribunal concerning the appropriate valuation of the rights to play recorded music in nightclubs and other late night venues.

2005-06 **Minter Ellison and Freehills/Santos**
Gas supply agreement arbitrations
Principal economic expert in two separate arbitrations of the price to apply following review of two substantial gas supply agreements between the South West Queensland gas producers and, respectively, a large industrial customer and major gas retailer.

2002-03 **ActewAGL**
Consumer willingness to pay
Directed a one year study of consumers' willingness to pay for a range of attributes for electricity, gas and water services in the ACT. This study involved the use of focus groups, the development of a pilot survey and then the implementation of a stated preference choice modelling survey of household and commercial customer segments for each utility service.

2002-03 **National Electricity Market Management Co**
Participant fee determination
Advice to NEMMCO in the context of its 2003 Determination of the structure of Participant Fees, for the recovery of NEMMCO and NECA's costs from participants in the national electricity market.

Competition and Mergers

2012-13 **Minter Ellison/Confidential Client**
Merger clearance
Expert reports submitted to the ACCC in the context of a confidential application for clearance of a proposed acquisition in the industrial gases industry.

2011-12	**Gilbert + Tobin/Pact Group** **Merger clearance** Expert reports submitted to the ACCC on the competitive implications of the proposed acquisition of plastic packaging manufacturer Viscount Plastics by Pact Group.
2010-12	**Mallesons/APA** **Merger clearance** Expert reports submitted to the ACCC on the competitive implications of the proposed acquisition of the gas pipeline assets of Hastings Diversified Utilities Fund by APA Group.
2010-11	**Johnson Winter & Slattery/ATC and ARB** **Competitive effects of agreement** Expert reports and testimony in Federal Court proceedings concerning the competitive effects of restrictions on the use of artificial breeding techniques in the breeding of thoroughbred horses for racing.
2010-11	**Victorian Government Solicitor/State of Victoria** **Competitive effects of agreement** Expert report prepared for the State of Victoria on the effects of certain restrictions applying to the trading of water rights on inter-state trade in the context of a constitutional challenge brought against the state of Victoria by the state of South Australia.
2009-11	**Arnold + Porter/Visa Inc, Mastercard Inc and others** **Payment card markets** Expert reports and deposition testimony on behalf of defendants in the United States Re Payment Card Interchange Fee and Merchant Discount Antitrust Litigation, on the effects of regulatory interventions in the Australian payment cards sector.
2010	**Australian Competition and Consumer Commission** **NBN Points of Interconnection** Report and advice on the competition implications in the markets for both telecommunications backhaul and retail broadband services of different choices as to the number of 'points of interconnection' in the proposed architecture of the national broadband network.
2010	**JWS, Gilbert & Tobin/Jetset Travelworld, Stella Travel Services** **Merger clearance** Advice on the competitive implications of the merger between Jetset Travelworld and Stella Travel Services.

2009-10	**Australian Government Solicitor/ACCC** **Misuse of market power** Expert report and testimony in the context of Federal Court proceedings brought by the ACCC against Cement Australia in relation to conduct alleged to have breached sections 45, 46 and 47 of the Trade Practices Act.
2008-10	**Gilbert & Tobin/Confidential** **Merger assessment** Advice on the competitive implications of the then proposed merger and then subsequently the proposed iron ore production joint venture between BHP Billiton and Rio Tinto.
2008-10	**Allens Arthur Robinson/Amcor** **Cartel damages assessment** Advice and preparation of an expert report on the approach to and quantification of economic loss in the context of two separate actions seeking damages arising from alleged cartel conduct.
2009	**State Solicitor's Office/Forest Products Commission** **Alleged breach of s46** Expert advice in the context of Federal Court proceedings alleging breaches of section 46 of the Trade Practices Act.
2009	**Clayton Utz/Confidential Client** **Joint venture arrangement** Reviewed the competitive implications under s50 of the Trade Practices Act of a proposed joint venture transaction in the rail industry.
2009	**Blake Dawson Waldron/Airservices** **Effect of potential industrial action by Air Traffic Controllers** Prepared an expert report in the context of a potential application to the Australian Industrial Relations Commission for termination or suspension of a bargaining period addressing the economic effect that certain forms of industrial action by Air Traffic Controllers would be likely to have on passengers, businesses, and the Australian economy.
2005-06, 08-09	**Phillips Fox/Fortescue Metals Group** **Access to bottleneck facilities** Expert report and testimony in the Federal Court proceedings concerning whether or not access to the BHP Billiton and Rio Tinto rail lines, serving iron ore export markets in the Pilbara, amounted to use of a production process. Subsequently, prepared expert reports on matters arising in interpreting the criteria for declaration under Part IIIA, and testified before the Competition Tribunal in late 2009.

2009	**Clayton Utz/Confidential Client** **Competitive implications of agreement** Advice on the competitive effects of a joint venture arrangement in the port terminal sector, in the context of Federal Court proceedings brought by the ACCC under section 45 of the Trade Practices Act.
2009	**Australian Competition and Consumer Commission** **Competitive effects of buy-sell agreements** Advice to the ACCC on the extent to which buy-sell arrangements between the four major refiner-marketers of petroleum products in Australia may be inhibiting competition in a relevant market.
2008-09	**Watson Mangioni/ICS Global** **Alleged misuse of market power** Expert report prepared in the context of Federal Court proceedings alleging breaches of section 46 of the Trade Practices Act.
2008-09	**Australian Competition and Consumer Commission** **Competitive effects of various agreements** Expert advice on potential theories of competitive harm arising from agreements between competitors in the oil and gas, and petroleum retailing industry sectors.
2008	**Johnson Winter & Slattery/Pepsico** **Merger analysis** Advice on the competitive implications certain potential transactions in the soft drinks sector.
2008	**Australian Competition and Consumer Commission** **Exemption from access undertaking** 'Peer review' report of the ACCC's draft decision on applications by Telstra for exemption from its standard access obligations (SAOs) for the supply by resale of the local carriage service (LCS) and wholesale line rental (WLR) in 387 exchange service areas in metropolitan Australia.
2008	**Deacons/eBay** **Exclusive dealing notification** Expert report submitted to the ACCC analysing the competitive effects of eBay's proposal that users of its online marketplace be required to settle transactions using eBay's associated entity, PayPal
2007-08	**Australian Energy Market Commission** **Wholesale market implications for retail competition** Retained to provide an overview of the operation and structure of the wholesale gas and electricity markets within the National Electricity Market (NEM) jurisdictions and to identify the issues that the AEMC should consider when assessing the influence of the wholesale markets on competition within the retail gas market in each jurisdiction.

2006-07	**Essential Services Commission of South Australia** **Competition assessment** Directed the preparation of a comprehensive report analysing the effectiveness of competition in retail electricity and gas markets in South Australia.
2006-07	**Allens Arthur Robinson/Confidential Client** **Merger clearance** Retained to provide advice on competition issues arising in the context of s50 clearance of a proposed merger in the board packaging industry.
2006-07	**Johnson Winter & Slattery/Confidential Client** **Damages assessment** Advice on the quantification of damages arising from alleged cartel conduct in the electricity transformer sector.
2006	**Minter Ellison/Confidential Client** **Misuse of market power** Expert economic advice in relation to market definition, market power and taking advantage in the context of an alleged price squeeze between wholesale and retail prices for fixed line telecommunications services, for proceedings brought under section 46 of the Trade Practices Act. The proceedings were withdrawn following regulatory amendments by the ACCC.
2006	**DLA Phillips Fox/Donhad** **Merger clearance** Preparation of an expert report on competition issues arising in the context of s50 clearance for the proposed Smorgon/One Steel merger.
2006	**Johnson Winter & Slattery/Qantas Airways** **Competition effects of proposed price fixing agreement** Assessed the competition effects of the proposed trans-Tasman networks agreement between Air New Zealand and Qantas Airways.
2006	**Phillips Fox/ACCC** **Vertical foreclosure** Advice in the context of proceedings before the Federal Court concerning the acquisition of Patrick Corporation by Toll Holdings. The proceedings were subsequently withdrawn following a S87B undertaking made by Toll.
2006	**Gilbert + Tobin/AWB** **Arbitration, access to bottleneck facilities** Expert report and testimony in an arbitration concerning the imposition of throughput fees for grain received at port and so bypassing the grain storage, handling and rail transport network in South Australia.

2006	**Qantas Airways, Australia/Singapore** **Assessment of single economic entity** Advice in the context of Qantas' Application for Decision to the Competition Commission of Singapore that the agreement between it and Orangestar did not fall within the ambit of the price-fixing and market sharing provisions of the Singapore Competition Act.
2005-06	**Qantas Airways, Australia/Singapore** **Competition effects of price fixing agreement** Expert report submitted to the Competition Commission of Singapore evaluating the net economic benefits of a price fixing/market sharing agreement, in relation to an application for exemption from the section 34 prohibition in the Competition Act of Singapore.
2005-06	**Australian Competition Consumer Commission** **Electricity generation market competition** Advice on the competition effects under S50 of the Trade Practices Act of three separate proposed transactions involving the merger of generation plant operating in the national electricity market.
2005	**Gilbert + Tobin/Hong Kong Government, Hong Kong** **Petrol market competition** Directed a NERA team working with Gilbert + Tobin that investigated the effectiveness of competition in the auto-fuel retailing market in Hong Kong.
2005	**Phillips Fox/National Competition Council** **Access and competition in gas production and retail markets** Retained as expert witness in the appeal before the WA Gas Review Board of the decision to revoke coverage under the gas code of the Goldfields pipeline. Proceedings brought by the pipeline operator were subsequently withdrawn.
2004-05	**Gilbert + Tobin/APCA** **Competition and access to Eftpos system** Economic advisor to the Australian Payments Clearing Association in connection with the development of an access regime for the debit card/Eftpos system, so as to address a range of competition concerns expressed by the Reserve Bank of Australia and the ACCC. This work included an expert report examining barriers to entry to Eftpos and the extent to which these could be overcome by an access regime.
2003-05	**Phillips Fox/Austrac** **Misuse of market power** Retained to assist with all economic aspects of a potential Federal Court action under s46 of the Trade Practices Act alleging misuse of market power in the rail freight market.

2004 **Clayton Utz/Sydney Water Corporation**
Competition in sewage treatment
Retained to assist with Sydney Water's response to the application to have Sydney's waste water reticulation network declared under Part IIIa of the Trade Practices Act.

2004 **Blake Dawson Waldron/Boral**
Competition analysis of cement market
Advice on Boral's proposed acquisition of Adelaide Brighton Ltd, a cement industry merger opposed in Federal Court proceedings by the ACCC. Boral subsequently decided not to proceed with the transaction.

2004 **Minter Ellison/Singapore Power**
Merger clearance
Advice on competition issues arising from the proposed acquisition of TXU's Australian energy sector assets by Singapore Power. This included the submission of an expert report to the ACCC.

2004 **Mallesons/Orica**
Competition in gas production and retail markets
Retained as expert witness in the appeal by Orica against the Minister's decision to revoke coverage under the gas code of the substantial part of the Moomba to Sydney gas pipeline. The case was subsequently settled.

2004 **Courts, Fiji**
Merger clearance, abuse of market power
Prepared a report for submission to the Fijian Commerce Commission on the competition implications of the Courts' acquisition of the former Burns Philip retailing business, and related allegations of abuse of market power. The Commission subsequently cleared Courts of all competition concerns.

2003-04 **Mallesons/Sydney Airport Corporation**
Competition in air travel market
Expert report and testimony before the Australian Competition Tribunal on economic aspects of the application by Virgin Blue for declaration of airside facilities at Sydney Airport under Part IIIa of the Trade Practices Act.

2003-04 **Bartier Perry/ DM Faulkner**
Alleged collusive conduct
Submitted an expert report to the Federal Court in connection with allegations under s45 of the Trade Practices Act of collusive conduct leading to the substantial lessening of competition in the market for scrap metal. The 'substantial lessening of competition' element of this case was subsequently withdrawn.

2002-04 **Essential Services Commission**
Effectiveness of competition
Advisor on six separate reviews of the effectiveness of competition and the impact of existing or proposed measures designed to enhance competition in the markets for wholesale gas supply, port channel access services, liquid petroleum gas, retail electricity and gas supplies, and port services.

2003 **Gilbert + Tobin/AGL**
Vertical integration in electricity markets
Prepared a report on the international experience of vertical integration of electricity generation and retailing markets, in connection with proceedings brought by AGL against the ACCC. This report examined the principles applied by competition authorities in assessing such developments, and evidence of the subsequent impact on competition.

2002-03 **National Competition Council**
Gas market competition
Expert report in connection with the application by East Australian Pipeline Limited for revocation of coverage under the Gas Code of the Moomba to Sydney Pipeline System. The report addressed both the design of a test for whether market power was being exercised through pipeline transportation prices substantially in excess of long-run economic cost, and the assessment of existing prices by reference to this principle.

2001-03 **Blake Dawson Waldron/Qantas Airways**
Alleged predatory conduct
Directed a NERA team advising on all economic aspects of an alleged misuse of market power (section 46 of the Trade Practices Act) in Federal Court proceedings brought against Qantas by the ACCC. The proceedings were withdrawn soon after responding expert statements were filed.

2002 **Phillips Fox/AWB Limited**
Access and competition in bulk freight transportation
Expert report on the pricing arrangements for third party access to the Victorian rail network and their impact on competition in the related bulk freight transportation services market, preparation for the appeal before the Australian Competition Tribunal of the Minister's decision not to declare the Victorian intra-state rail network, pursuant to Part IIIA of the Trade Practices Act.

2002 **Australian Competition and Consumer Commission**
Anti-competitive bundling or tying strategies
Prepared two (published) reports setting out an economic framework for evaluating whether the sale of bundled or tied products may be anti-competitive. These reports define the pre-conditions for such strategies to be anti-competitive, and discuss the potential role and pitfalls of imputation tests for anti-competitive product bundling.

2002 **Minter Ellison/SPI PowerNet**
Merger clearance
Advice on competition issues arising in the acquisition of energy sector assets in Victoria.

2001 **Gilbert + Tobin/AGL**
Gas market competition
Advised counsel for AGL in connection with the application by Duke Energy to the Australian Competition Tribunal for review of the decision by the National Competition Council to recommend that the eastern gas pipeline should be subject to price regulation under the national gas code.

2000 **One.Tel**
Competitive aspects of Mobile Number Portability
Advised on the competitive aspects of proposed procedures for Mobile Number Portability and whether these arrangements breached the Trade Practices Act in relation to substantial lessening of competition.

2000 **Baker & McKenzie/Scottish Power**
Impact of consolidation on competition
Expert report on the extent to which the acquisition of the Victorian electricity distribution and retail business, Powercor by an entity with interests in the national electricity market may lead to a 'substantial lessening of competition' in a relevant market.

Institutional and Regulatory Reform

2008-11 **Department of Sustainability and Environment**
Management of bulk water supply
Various advice on the concept and merits of establishing market based arrangements to guide both the day-to-day operation of the bulk water supply system in metropolitan Melbourne, as well as the trading of rights to water between the metropolitan water supply system and those throughout the state of Victoria.

2008	**Department of Treasury and Finance** **Access regime for water networks** Prepared a report on the principles that should be applied in developing a state-wide third party access regime for water supply networks.
2007	**Economic Regulatory Authority** **Options for competitive supply bulk water** Prepared a report on institutional and structural reforms necessary to encourage the development of options for the procurement of alternative water supplies from third parties.
2006	**Bulk Entitlement Management Committee** **Development of urban water market** Prepared a report for the four Melbourne water businesses on options for devolution of the management of water entitlements from collective to individual responsibility, including the development of associated arrangements for oversight and co-ordination of the decentralised management and trading of water rights.
2003-05	**Goldman Sachs/Airport Authority, Hong Kong** **Framework for economic regulation** Lead a team advising on the options and detailed design of the economic regulatory arrangements needed to support the forthcoming privatisation of Hong Kong Airport.
2003-04	**Ministry of Finance, Thailand** **Framework for economic regulation** Lead a team advising on the detailed design and implementation of a framework for the economic regulation of the Thai water sector in order to support the proposed corporatisation and then privatisation of the Metropolitan Water Authority of Bangkok.
2003	**Metrowater and Auckland City, New Zealand** **Water industry reform options** Report on alternative business models for the Auckland City water services supplier, Metrowater, in the context of proposals for structural reform elsewhere in the industry. This work examined the long term drivers of water industry efficiency and the costs and benefits of alternative structural reform options.

Sworn Testimony, Transcribed Evidence[29]

2013

Expert evidence before the Supreme Court of Victoria on behalf of Maddingley Brown Coal in the matter of Maddingley Brown Coal v Environment Protection Agency of Victoria
Expert reports, sworn evidence, Melbourne, 12 August 2013

Expert evidence before the Federal Court on behalf of Modtech v GPT Management and Others
Expert reports, sworn evidence, Melbourne, 27 March 2013

2012

Expert evidence before the Supreme Court of Queensland on behalf of Origin Energy Electricity Ltd and Others v Queensland Competition Authority and Others
Expert reports, sworn evidence, Brisbane, 3 December 2012

2011

Expert evidence before the Federal Court on behalf of the Australian Turf Club and Australian Racing Board in the matter of Bruce McHugh v ATC and Others
Expert report, transcribed evidence, Sydney, 12 and 14 October 2011

Expert evidence in arbitration proceedings before J von Doussa, QC, on behalf of Santos in the matter of Santos and Others v Government of South Australia
Expert report, transcribed evidence, Adelaide, 13-15 September 2011

Expert evidence before a panel of arbitrators on behalf of UNELCO in the matter of UNELCO v Government of Vanuatu
Expert report, transcribed evidence, Melbourne, 23 March and 21 April 2011

Expert evidence before the Federal Court on behalf of ActewAGL in the matter of ActewAGL v Australian Energy Regulator
Expert report, sworn evidence, Sydney, 17 March 2011

Deposition Testimony in Re Payment Care Interchange and Merchant Discount Litigation, in the United States District Court for the Eastern District of New York
Deposition testimony, District of Colombia, 18 January 2011

[29] Past ten years.

2010

Expert evidence before the Federal Court in behalf of the Australia Competition and Consumer Commission in the matter of ACCC v Cement Australia and others
Expert report, sworn evidence, Brisbane, 19-21 October 2010

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Input Methodologies Emerging View Paper
Transcribed evidence, public hearings, Wellington, 24 February 2010

Deposition Testimony in *Re Payment Card Interchange and Merchant Discount Antitrust Litigation*, in the United States District Court for the Eastern District of New York
Deposition Testimony, District of Columbia, 18 February 2010

2009

Expert evidence before the Australian Competition Tribunal on behalf of Fortescue Metals Group Ltd, in the matter of Application for Review of Decision in Relation to Declaration of Services Provided by the Robe, Hamersley, Mt Newman and Goldsworthy Railways
Expert report, sworn evidence, Melbourne, 12-13 October and 5-6 November 2009

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Input Methodologies Discussion Paper
Transcribed evidence, public hearings, Wellington, 16 September 2009

Expert evidence before the Federal Court on behalf of Fortescue Metals Group Ltd, in the matter of ASIC v Fortescue Metals Group and Andrew Forrest
Expert report, sworn evidence, Perth, 29 April–1 May 2009

Expert report and evidence in arbitration proceedings before Hon Michael McHugh, AC QC, and Roger Gyles, QC, between Origin Energy and AGL
Expert report, sworn evidence, Sydney, 19-24 March 2009

2008

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Draft Decision on Authorisation for the Control of Natural Gas Pipeline Services
Transcribed evidence, public hearings, Wellington, 21 February 2008

2007

Expert report and evidence in arbitration proceedings before Sir Daryl Dawson between SteriCorp and Stericycle Inc.
Expert report, sworn evidence, 11 July 2007

2006	**Expert report and evidence in arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and others, and AGL** Expert report, sworn evidence, November 2006
	Expert report and evidence before the Federal Court on behalf of Fortescue Metals Group in the matter of BHP Billiton v National Competition Council and Others Expert report, sworn evidence, November 2006
	Expert report and evidence in arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and Others, and Xstrata Queensland Expert report, sworn evidence, September 2006
	Expert report and evidence before the Copyright Tribunal on behalf of the Australian Hotels Association and others in the matter of PPCA v AHA and Others Expert report, sworn evidence, May 2006
	Expert report and evidence in arbitration proceedings before Hon Michael McHugh, AC QC, on the matter of AWB Limited v ABB Grain Limited Expert report, sworn evidence, 24 May 2006
	Expert report and evidence to Victorian Appeal Panel, in the matter of the appeal by United Energy Distribution of the Electricity Price Determination of the Essential Services Commission Expert report, sworn evidence, 10 February 2006
2005	**Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Notice of Intention to Declare Control of Unison Networks** Transcribed evidence, public hearings, Wellington, 17 November 2005
	Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on Asset Valuation choice and the electricity industry disclosure regime Transcribed evidence, public hearings, Wellington, 11 April 2005
2004	**Expert report and evidence to the Australian Competition Tribunal, in the matter of Virgin Blue Airlines v Sydney Airport Corporation** Expert reports, sworn evidence, 19-20 October 2004

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on the ODV Handbook for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 26 April 2004

2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on re-setting the price path threshold for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 5 November 2003

Expert evidence on behalf of NGC Holdings, in response to the Commerce Commission's draft framework paper for the gas control inquiry.
Transcribed evidence, public hearings, 3 September 2003

Affidavit submitted to the Federal Court, in the matter of ACCC v DM Faulkner and Others
Expert report, Federal Court of Australia, May 2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on a targeted control regime for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 March 2003

2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of asset valuation methodologies for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 November 2002

Expert report and evidence on behalf of Optus Networks and Optus Vision Ltd, in the matter of an arbitration with United Energy Ltd
Expert report, prior to settlement, 18 October 2002

Expert report and evidence on behalf of TransGrid before the National Electricity Tribunal, in the matter of Murraylink Transmission Company v NEMMCO, TransGrid, and others
Sworn Testimony, National Electricity Tribunal, Melbourne, 26 August 2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of control regimes for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 21 August 2002

Affidavit and testimony before the Supreme Court of Western Australia, in the matter of Epic Energy v Dr Ken Michael – Independent Gas Access Regulator
Sworn testimony, Supreme Court of Western Australia, November 2002

2001

Expert evidence on behalf of Auckland International Airport, in the Commerce Commission's review of airfield price control
Transcribed evidence, public hearings, Wellington, 4-5 September 2001

Expert evidence on behalf of Optus Networks, in the matter of Optus Networks v United Energy
Mediation before Trevor Morling QC, Sydney, August and September 2001

Expert evidence on behalf of Sydney Airports Corporation in the Productivity Commission's review of airport regulation
Transcribed evidence, public hearings, Melbourne, 3 April 2001

Affidavit submitted to Supreme Court of Victoria, in the matter of TXU v Office of the Regulator-General
Sworn testimony, Supreme Court of Victoria, 23-26 March 2001

Speeches and Publications[30]

2013	**Energy in WA Conference** Capacity Payments in the WEM – Time to Switch? Panel Discussion, Perth, 21 August 2013
	ACCC/AER Regulatory Conference Designing Customer Engagement Speech, Brisbane, 25 July 2013
	Victorian Reinsurance Discussion Group Australian Mining – When Opportunities and Risk Collide Speech, Melbourne, 1 March 2013
	NZ Downstream Conference Investment and Regulation Panel Discussion, Auckland, 25 July 2013
2012	**Rising Stars Competition Law Workshop** Expert Evidence in Competition Cases Speech, Sydney, 24 November 2012
	KPPU – Workshop on the Economics of Merger Analysis Theories and Methods for Measuring the Competitive Effects of Mergers Speech, Bali, 19-21 November 2012
	University of South Australia – Competition and Consumer Workshop Reflections on Part IIIA of the Competition Act Speech, Adelaide, 12 October 2012
	NZ Downstream Conference Lines company consolidation – what are the benefits and risks? Panel discussion, Auckland, 6-7 March 2012
2011	**Law Council of Australia - Competition Workshop** Coordinated effects in merger assessments Speech, Gold Coast, 27 August 2011
	ACCC Regulatory Conference Adapting Energy Markets to a Low Carbon Future Speech, Brisbane, 28 July 2011

[30] Past seven years

2010	**IPART Efficiency and Competition in Infrastructure** Improving Performance Incentives for GTE's Speech, Sydney, 7 May 2010
	Law and Economics Association of New Zealand Shareholder Class Actions – A Rising Trend in Australia Speeches, Auckland and Wellington, 15-16 November 2010
2009	**ACCC Regulatory Conference** Substitutes and Complements for Traditional Regulation Speech, Gold Coast, 30 July 2009
	Minter Ellison Shareholder Class Action Seminar Investor Class Actions – Economic Evidence Speech, Sydney, 18 March 2009
	Competition Law and Regulation Conference Commerce Amendment Act: Impact on Electricity Lines Businesses Speech, Wellington, 27 February 2009
2008	**Non-Executive Directors** Shareholder Class Actions in Australia Speech, Sydney, 28 July 2008
	Mergers & Acquisitions: Strategies 2008 Competition Law Implications for Mergers & Acquisitions Speech, Sydney, 27 May 2008
	Institute for Study of Competition and Regulation Role of Merits Review under Part 4 and Part 4A of the Commerce Act Speech, Wellington, 20 February 2008
2007	**Law Council of Australia - Trade Practices Workshop** **Hypothetical breach of s46** Economic expert in mock trial, 20 October 2007
	Assessing the Merits of Early Termination Fees, *Economics of Antitrust: Complex Issues in a Dynamic Economy,* Wu, Lawrence (Ed) NERA Economic Consulting 2007
	Assessing the Impact of Competition Policy Reforms on Infrastructure Performance **ACCC Regulation Conference** Speech, Gold Coast, 27 July 2007

2006 **Trade Practices Workshop**
Access to Monopoly Infrastructure Under the Trade Practices Act: Current Issues with Part IIIa and Section 46
Conference Paper Co-Author, Canberra, 22 July 2006

Report qualifications/assumptions and limiting conditions

This report is for the exclusive use of the NERA Economic Consulting client named herein. There are no third party beneficiaries with respect to this report, and NERA Economic Consulting does not accept any liability to any third party.

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