APA GasNet proposed depreciation approach

A REPORT PREPARED FOR THE AUSTRALIAN ENERGY REGULATOR

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Figures

Executive summary

Frontier Economics has prepared this report for the AER examining APA GasNet's proposed approach to depreciation for the Victorian gas transmission system (VTS). In particular, this report advises whether APA GasNet's proposed depreciation approach is likely to assist reference tariffs to vary, over time, in a way that promotes efficient growth in the market for reference services in accordance with clause 89(1) of the National Gas Rules (NGR).

APA GasNet's proposed approach to depreciation

APA GasNet's approach involves moving from a real to a nominal basis for determining the return of capital in relation to the APA GasNet's capital base. The implications of such a move would be to increase regulatory depreciation in the near term and reduce it in later years relative to what it would be under the current real approach. The overall effect on the NPV of its returns should be nil.

In its Draft Decision, the AER rejected APA GasNet's proposed approach to depreciation on the basis that it did not satisfy the NGR. In particular, the AER considered the proposed approach would not promote efficient growth in the market for reference services provided by the VTS. This was because APA GasNet's proposed approach would encourage:

- Inefficient asset utilisation
- Unnecessarily high prices in the short to medium term
- Inefficient management of assets.

In its revised access arrangement submission, APA GasNet chose not to accept the AER's requested revisions to its proposed approach to depreciation. APA GasNet contended that its proposed approach would promote efficient growth in the market for reference services provided by the VTS because:

- APA GasNet's approach would provide a more stable path of reference tariffs
- Capacity on the VTS is heavily utilised and would require augmentation
- Expenditure requirements for the VTS are likely to increase in future access arrangement periods.

APA GasNet disagreed with the AER's concerns for similar reasons.

In its report for APA GasNet, PwC suggested that reference prices should signal to consumers the relative scarcity of the resources used to provide the reference services. In the absence of capacity constraints and other cost pressures, efficient prices should be stable in real terms over the life of the infrastructure. Where capacity constraints were present or likely, prices should rise (in real terms) in times of constraints and be lower at times of low system utilisation. A reduction

of prices at times of constraints could not increase allocative efficiency; but it may reduce efficiency if it means that prices need to be commensurately higher at a future point in time when capacity constraints have been overcome. PwC noted the VTS is nearing or at capacity in at least one major location.

The PwC report went on to consider four scenarios for future capital expenditure over the next 20 years. Under all scenarios, the AER's approach produced an immediate sharp fall in reference tariffs, with gradual rises over the remainder of the period. By contrast, the APA GasNet approach led to reference tariffs that fell in real terms to varying degrees. Taking into account a range of factors, such as the likelihood and cost of future investment, trends in the risk-free rate and other cost drivers such as changing safety requirements and urban encroachment, PwC concluded that APA GasNet's approach to depreciation was more likely to be consistent with the NGR than the AER's approach.

Evaluation of APA GasNet's proposed approach

Whether APA GasNet's proposed depreciation approach would promote efficient growth in the market for the relevant reference services largely turns on whether the approach would lead to reference tariffs that vary in accordance with the long run marginal cost (LRMC) of providing these services. The LRMC of reference services provided by the VTS will vary according to the level of spare capacity on the system and the cost of augmentation required to meet an increment of demand growth. As these variables may vary across the VTS, the LRMC of reference services will also tend to vary on a locational basis.

Mr Fothergill's statutory declaration for APA GasNet made the most specific assertions regarding capacity constraints, suggesting that the Northern Zone was operating at maximum capacity and the South West Pipeline was also facing constraints. However, a lack of references to other sources of information makes it difficult to assess the veracity of these assertions. But even if constraints arose in these particular areas, APA GasNet could rebalance its tariffs, charging higher reference tariffs to Northern Zone and export customers within its overall revenue cap. The AER approach does not imply that reference tariffs *throughout* the VTS must be reduced.

PwC commented that AEMO publications suggest the VTS is constrained in the Melbourne and Geelong Zones as well as the Gippsland Zone. Our analysis found that AEMO's peak gas demand forecasts – especially from gas powered generation (GPG) – have been revised down over time. As such, constraints in these parts of the VTS are now not likely to arise for over a decade. The timing of these constraints would be delayed even further under more realistic assumptions about the carbon price. As such, we do not believe that the VTS is generally at or near capacity constraints. To promote efficient growth in the market for reference services, the level of APA GasNet's reference service tariffs should reflect these circumstances.

Even if capital expenditure on the VTS is required to address capacity constraints sooner than we expect, this would not imply a high LRMC of VTS usage. The extent to which the LRMC of network usage would rise prior to the need for augmentation would depend on the costs of addressing those constraints relative to historical levels of capital expenditure. If the level of expenditure required to address constraints is relatively small, the LRMC of network usage may remain fairly low even just prior to the need for investment. Evidence on the costs of potential augmentations suggests that they would not lead to a large change in APA GasNet's capital expenditures. Further, the tariff scenarios examined by PwC assume any required capital expenditure to address constraints is wholly additional to historical levels of expenditure. We do not believe such an approach is credible. Even if some capital expenditure is required to address constraints within the next decade, the AER's approach to depreciation is likely to better reflect LRMC than would APA GasNet's approach, under which tariffs would start high and continue to drift down.

Subject to reference tariffs appropriately reflecting the LRMC of system usage, remaining regulated revenues should be recovered through a mark-up that is stable in real terms. Given that there is unlikely to be a need for substantially higher-than-historical levels of capital expenditure over the next 10 years or more, we consider that the AER's approach to depreciation is likely to yield more stable real tariffs than APA GasNet's proposed approach, which is appropriate under such conditions.

Comments on AER reasoning in the Draft Decision

We agree with the AER that APA GasNet's approach to depreciation would unnecessarily discourage growth in gas demand over the next 5 to 10 years while the average LRMC of the VTS remains relatively low. This could promote continued underutilisation of substantial portions of the VTS, especially the key Longford to Melbourne pipeline. We also agree with the AER that APA GasNet's approach to depreciation would lead to unnecessarily high prices in the short to medium term, at least in certain parts of the VTS. Last, we are inclined to accept that APA GasNet's approach to depreciation may create some risks for inefficient asset management, although such instances of 'gaming' may be rare.

Conclusion

In light of the hefty downward revisions to peak day gas demand forecasts made in recent years, it is reasonable and efficient for average reference tariffs to fall to reflect the increased spare capacity on the VTS now and over the next decade. The AER's approach to depreciation would achieve these near-term reference tariff reductions to a much greater extent than APA GasNet's proposed approach. Further, real reference tariffs under the AER's approach would begin to exceed tariffs under APA GasNet's approach precisely at the time the LRMC of VTS usage will be rising. Therefore, we consider that APA GasNet's proposed approach would not lead to reference tariffs varying, over time, in a way that

promotes efficient growth in the market for reference services in accordance with the NGR.

1 Introduction

Frontier Economics has prepared this report for the Australian Energy Regulator (AER) examining APA GasNet's proposed approach to depreciation for the Victorian gas transmission system (VTS).This report critically assesses APA GasNet's proposed depreciation approach, as contained in its Revised Proposal and supported by a report from PwC. In particular, this report advises whether APA GasNet's proposed depreciation approach is likely to assist reference tariffs to vary, over time, in a way that promotes efficient growth in the market for reference services in accordance with clause 89(1) of the National Gas Rules (NGR). The Frontier Economics staff involved in preparing this report have read and are familiar with the Federal Court Guidelines for expert witnesses and agree to be bound by their contents.

1.1 Terms of reference

The terms of reference provided to Frontier Economics were as follows.

> The AER requires the Consultant to produce a written report on APA GasNet's proposed depreciation approach. The Consultant should critically assess APA GasNet's revised proposal (including PwC's report)[1] and advise whether APA GasNet's proposed change of depreciation approach is designed so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services.[2] Consideration should be given to economic theory and APA GasNet's circumstances.
>
> In assessing APA GasNet's revised proposal, the Consultant should advise whether the AER's concerns expressed in its draft decision regarding this matter remain valid.[3,4]
>
> The Consultant should also advise whether there are other matters the AER should consider in deciding whether the proposed depreciation approach is designed so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services.

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1 APA GasNet, *Access arrangement revised proposal submission: Effective 1 January 2013–31 December 2017*, November 2012, chapter 6; PwC, *Depreciation of assets under the National Gas Rules*, November 2012 (attachment 6.1).

2 National Gas Rules, rule 89(1)(a).

3 AER, *Access arrangement draft decision: APA GasNet Australia (Operations) Pty Ltd 2013–17, Part 2 attachments*, September 2012, chapter 5.

4 The AER's assessment of APA GasNet's depreciation approach is undertaken with respect to rule 89(1) of the National Gas Rules, the National Gas Objective under Part 3, Division1, section 23 the National Gas Law (NGL), and the operation of Revenue and Pricing principles under Part 3, Division 2, Section 24 of the NGL.

The Consultant should possess expert knowledge of regulatory economics and experience in the energy markets, particularly relating to the Victorian gas network.

1.2 Reference material

In preparing this report, we have had regard to the following:

- APA GasNet's original access arrangement submission
- AER Draft Decision
- APA GasNet's revised proposal submission
- APA GasNet's revised proposal submission attachment 6.1, the PwC report
- APA GasNet's supporting analysis of projected price paths referred to in the APA GasNet revised proposal
- APA GasNet's revised proposal attachments 6.2 (statutory declaration from Mr Robert Wheals – confidential) and 6.3 (statutory declaration from Mr Mark Fothergill)
- AEMO, *Victorian Gas DTS Medium Term Outlook* (for 2011), which was Attachment A1 to AEMO, *2011 Gas Statement of Opportunities*
- AEMO, *2012 Victorian Annual Planning Report*
- AEMO, *2012 Victorian Gas DTS Medium Term Outlook*
- AEMO, *2011 National Transmission Development Plan*
- AEMO, *2012 National Transmission Development Plan*.

1.3 Report structure

This report is structured as follows:

- Section 2 outlines APA GasNet's proposed approach to depreciation
- Section 3 provides our evaluation of APA GasNet's proposed approach
- Section 4 offers some comments on the AER's reasoning in its Draft Decision
- Section 5 sets out our conclusions
- Appendix A outlines our capability.

2 APA GasNet's proposed approach to depreciation

This section discusses:

- APA GasNet's explanation of its proposed approach in its original access arrangement submission
- AER Draft Decision reasons for rejecting the proposed approach
- APA GasNet's reiteration of support for its proposed approach in its revised proposal, including the statutory declarations from Mr Robert Wheals and Mr Mark Fothergill on behalf of APA GasNet
- Report by APA GasNet's consultant, PwC, supporting the proposed approach.

2.1 Original submission

APA GasNet's proposed approach to depreciation was originally set out in its access arrangement submission of March 2012.[5] The approach involves moving from a real to a nominal basis for determining the return of capital in relation to the APA GasNet's capital base.

Moving from a real to a nominal basis for depreciation would mean:

- Not indexing the regulated capital base beyond 31 December 2012
- Not subtracting the inflation component applied to the capital base to calculate regulatory depreciation
- Applying a nominal WACC.

Therefore, as under the current approach, inflation would be recognised only once. Under the APA GasNet approach, inflation would be recognised in the calculation of the nominal WACC rather than through indexation of the capital base.

The implications of such a move would be to increase regulatory depreciation in the near term and reduce it in later years relative to what it would be under the current real approach. No rationale or justification for the change in approach was provided in APA GasNet's original proposal.

5 APA GasNet Australia (Operations) Pty Ltd, *Access Arrangement Submission, 1 January 2013 to 31 December 2017*, March 2012 (Original proposal submission).

APA GasNet noted in its submission:

> While the annual returns on and of capital in a particular year will differ between the two methodologies, the NPV of the returns, over the life of the asset, are the same under either approach, or on changing from one approach to the other.[6]

The submission supported this proposition with a hypothetical example of a single asset.

2.2 AER Draft Decision

In its Draft Decision,[7] the AER rejected APA GasNet's proposed approach to depreciation on the basis that it did not satisfy the requirements of clause 89(1) of the NGR. In particular, the AER considered the proposed approach would not promote efficient growth in the market for reference services provided by the VTS. This was because APA GasNet's proposed approach would encourage:

- Inefficient asset utilisation
- Unnecessarily high prices in the short to medium term
- Inefficient management of assets.

These contentions are expanded further below.

The AER considered that the proposed approach offered no offsetting benefits to users that could be considered to be in customers' long term interests.

The impact of the AER's rejection of APA GasNet's proposed approach is that APA GasNet's depreciation allowance over the access arrangement period would fall from $157.5 million under APA GasNet's proposed nominal approach to $56.2 million under the AER's conventional real approach. The AER did not consider that continuation of the current real approach to depreciation would impinge upon APA GasNet's reasonable cash flow needs, consistent with the NGR.

Finally, the AER noted that the only explanation for the change was provided informally by APA GasNet staff, who indicated that by bringing forward cash flows, it would help insulate APA GasNet from an anticipated fall in the regulated rate of return on its assets.[8]

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6 Original proposal submission, p.127.

7 AER, *Access arrangement draft decision, APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 1*, September 2012 (Draft Decision – Part 1), pp.41-42.

8 AER, *Access arrangement draft decision, APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2*, September 2012 (Draft Decision – Part 2), pp.175-6.

2.2.1 Inefficient asset utilisation

The AER noted that APA GasNet's proposed approach to depreciation front-end loads cash flows and consequently produces a steeper revenue profile. This would lead to higher reference prices early in the asset's life and lower prices later in the asset's life. The AER considered this would lead to inefficient growth in the market for reference services because it would unnecessarily discourage demand early in the asset's life and encourage greater use later in the asset's life. The AER gave two reasons why it believed this would be the opposite of what would be expected in an efficient market:

- First, in an efficient market, prices would initially be low to encourage use of new assets and to attain economies of scale and scope. While APA GasNet's network is relatively mature, the change in approach would affect extension and expansions where demand would be less mature. To this end, the NGR recognises that a substantial proportion of depreciation may have to be deferred to encourage utilisation.
- Second, as an asset nears the end of its useful life, it would become more susceptible to breakdowns. In this case, low prices may be inefficient if they lead to over-utilisation and earlier replacement than otherwise would be necessary.[9]

In its submission on APA GasNet's original submission, AGL stated that any significant changes in network charges should be gradual and incremental.[10]

2.2.2 Unnecessarily high prices in the short to medium term

The AER noted that APA GasNet's proposed approach would increase APA GasNet's expected revenues by 15.3 percent over the 2013-17 access arrangement period as compared to under the conventional approach.[11] In the AER's view, this would cause unnecessarily high prices in the short to medium term to customers. This would discourage gas usage and downstream investment. The proposed approach would also mean that any future capital expenditure would be recovered more quickly, causing a greater step up in prices and revenues than would otherwise occur. This would effectively amplify any step changes in capital expenditure for all future periods.

The AER did not consider that such an outcome would encourage efficient growth in the market for reference services provided by the VTS. In support of this view, the AER referred to a submission from AGL, which emphasised the

9 Draft Decision – Part 2, pp.178-9.

10 Draft Decision – Part 2, p.179.

11 Draft Decision – Part 2, p.179.

need for network charges to be predictable and not subject to unreasonable steep cost fluctuations.[12]

2.2.3 Inefficient management of assets

The AER considered that APA GasNet's proposed approach to depreciation could produce perverse incentives on APA GasNet to:

- Replace assets sooner than otherwise: By leading to a lower depreciated historical cost valuation of the capital base than otherwise, the proposed approach could encourage premature and inefficient replacement so long as APA GasNet was able to earn the regulated rate of return on the replacement assets.
- Sell assets where the potential sale price exceeds the depreciated historical cost of the capital base: By leading to a lower depreciated historical cost valuation of the capital base than otherwise, the proposed approach could encourage the sale of assets where their market value exceeds their book value.[13]

Although the AER accepted that the latter effect may not prevent efficient development of the market, the AER considered it was not an incentive based on consideration of customers' long term interests.[14]

2.3 Revised proposal including attachments

In its revised access arrangement submission,[15] APA GasNet chose not to accept the AER's requested revisions to its proposed approach to depreciation. APA GasNet contended that its proposed approach would promote efficient growth in the market for reference services provided by the VTS. APA GasNet provided three reasons supporting its position:

- APA GasNet's approach would provide a more stable path of reference tariffs
- Capacity on the VTS was heavily utilised
- Expenditure requirements for the VTS are likely to increase in future access arrangement periods.[16]

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12 Draft Decision – Part 2, p.180.

13 Draft Decision – Part 2, p.181.

14 Draft Decision – Part 2, p.181.

15 APA GasNet Australia (Operations) Pty Ltd, *Access Arrangement Revised Proposal Submission, 1 January 2013 to 31 December 2017*, November 2012 (Revised proposal submission).

16 Revised proposal submission, pp.75-81.

These reasons are summarised in more detail below.

In addition, APA GasNet sought to refute each of the AER's concerns with APA GasNet's proposed approach to depreciation.[17] APA GasNet's refutations are also summarised in more detail below.

2.3.1 APA GasNet's reasons for its proposed depreciation approach

More stable path of reference tariffs

The revised proposal submission purported to show that APA GasNet's proposed approach to depreciation would lead to a much more stable tariff path over time than would the AER's approach.

The revised proposal submission indicated that under the proposed approach – and assuming a stable WACC and no increase in capital expenditure in future periods – tariffs would fall from about \$0.54/GJ currently to about \$0.48/GJ in 2013 and gradually rise to about \$0.52/GJ by 2023 and \$0.60/GJ by 2032 *in nominal terms*.[18] Under the AER's approach, tariffs would fall to about \$0.40/GJ in 2013 and then rise to \$0.49/GJ by 2023 and \$0.65/GJ by 2032, also in nominal terms.

APA GasNet contended that a more stable tariff path would better promote efficient growth in the market for reference services by providing more reliable signals to customers and service providers as to the genuinely sustainable level of reference tariffs and demand, respectively. By contrast, a depreciation approach that led to a substantial fall in reference tariffs followed by a rise would undermine investment certainty.[19]

In his statutory declaration, Robert Wheals of APA Group suggested that demand in the Northern Zone of the VTS was relatively more sensitive to reference tariffs than demand elsewhere in the system.[20] This was because of the nature of customers in the Zone, who were larger than typical customers elsewhere and were engaged in activities such as gas-fired generation and gas storage rather than domestic consumption. As the Northern Zone VTS is operating close to capacity, he suggested tariff falls could lead to demand for

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17 Revised proposal submission, pp.81-83.

18 Revised proposal submission, Figure 6.1, p.76. Capital expenditure for 2013-17 was based on the expenditures approved in the AER Draft Decision, which allowed approximately \$167 million in nominal terms over this period (see Draft Decision, Part 2 attachment, Table 2.2, pp.18-19). Capital expenditure for 2018-22 was also based on the same expenditure profile as for 2013-17.

19 Revised proposal submission, p.77.

20 Revised proposal submission – Attachment 6.2 (confidential) (Wheals statutory declaration), para 4, p.1.

capacity expansion in that Zone, which could in turn lead to tariff increases. But the extent to which additional capacity would be utilised was difficult to predict.

> If prices were expected to rise to a material extent in the future, then this would create a very uncertain environment for APA Group to make any investments in relation to the Northern Zone of the VTS.[21]

Conversely, Mr Wheals suggested that if reference tariffs remained stable, then demand in the Northern Zone would remain relatively stable, other things being equal. This would promote complementary investments by customers, such as in gas-fired power stations and gas storage. Such investments would be unlikely to occur if there was uncertainty or instability in reference tariffs.[22]

Capacity on the VTS heavily utilised

APA GasNet contended that the VTS was currently heavily utilised.[23] As a consequence, a substantial reduction in reference tariffs caused by the AER's approach to depreciation could lead to an increase in demand for reference services that could not be met without augmentation. Under these circumstances, a more stable path of reference tariffs would promote efficient growth in the market for the reference services.

To support the view that the VTS had currently no material excess capacity, APA GasNet's revised proposal referred to evidence from Mark Fothergill of APA Group.[24] In his statutory declaration, Mr Fothergill contended that the:

- Northern Zone was fully utilised, even following a recent augmentation
- South-West Pipeline was fully utilised on winter peak days
- Longford Zone had sufficient capacity to provide additional supply on days when the Northern Zone and/or the SWP were fully utilised.[25]

Mr Fothergill noted that APA Group was planning projects to increase capacity on the South West Pipeline (SWP) and in the Northern Zone. Both projects were due to be commissioned in 2015. Even following these projects, both parts of the network would remain heavily utilised and the Northern Zone would continue to face capacity constraints.[26]

Mr Fothergill noted that APA group was planning a project known as the Western Outer Ring Main (WORM) to facilitate flows between the SWP and

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21 Wheals statutory declaration, para 17, p.3.

22 Wheals statutory declaration, paras 18-19, pp.3-4.

23 Revised proposal submission, pp.78-80.

24 Revised proposal submission – Attachment 6.3 (Fothergill statutory declaration).

25 Fothergill statutory declaration, paras 7-10, p.2.

26 Fothergill statutory declaration, paras 14, p.3.

other parts of the VTS. However, this project had not received regulatory approval and therefore was unlikely to proceed in the next five years.[27]

Future VTS expenditure requirements

The revised proposal submission highlights that APA GasNet's future expenditure requirements are expected to increase for reasons other than ensuring adequate capacity to meet demand. These other reasons are to:

- Ensure compliance with current and future safety standards
- Adapt pipeline design to changes in the external environment, such as urban encroachment
- Repair aging parts of the pipeline.[28]

To support this view, the revised proposal again referred to the statutory declaration of Mark Fothergill. Mr Fothergill noted that one way pipeline owners could deal with issues such as changed safety standards and urban encroachment was to de-rate or augment existing pipelines.[29]

The only estimate of these categories of costs Mr Fothergill provided was $200 million over the next 15 years to account for urban encroachment.[30]

2.3.2 APA GasNet's refutation of the AER's concerns

Inefficient asset utilisation

The revised proposal submission disputed the AER's concern that APA GasNet's proposed approach to depreciation would lead to under-utilisation of system assets in the short term and over-utilisation later.[31] APA GasNet noted that the VTS was not a single asset but a system comprising many assets, some newer than others. Moreover, the VTS served a mature market with high levels of demand relative to system capacity. The revised proposal submission commented that reference tariffs were likely to rise in future due to a likely increase in the WACC and substantial capital expenditure to enable capacity augmentation, asset replacement and changes in the operating environment. APA GasNet contended that its proposed approach would help accommodate these expected future cost pressures by increasing the initial rate at which the value of

27 Fothergill statutory declaration, para 15, p.3.

28 Revised proposal submission, pp.80-81.

29 Fothergill statutory declaration, para 22, p.5.

30 Fothergill statutory declaration, para 25, p.5.

31 Revised proposal submission, pp.81-82.

the existing RAB is reduced. This would help promote a stable long term price path for reference services.

Unnecessarily high prices in the short to medium term

APA GasNet contended that its proposed approach to depreciation would not lead to an increase in tariffs but rather relatively stable reference prices in the short to medium term. By contrast, the AER's proposed approach would lead to a substantial reduction in tariffs. Therefore:

> ...it is not correct for the AER to suggest that implementation of APA GasNet's approach would lead to an increase in tariffs such that gas usage would be discouraged.[32]

Further, APA GasNet suggested that the 'short term reduction in tariffs' likely under the AER's depreciation approach would not increase utilisation of the VTS. This seems to contradict the comments made by Mr Wheals in his statutory declaration regarding Northern Zone demand.

Inefficient management of assets

APA GasNet submitted that the rate at which the existing RAB is initially depreciated would have no impact on its incentives to undertake future capital expenditure.[33] APA GasNet noted that it typically prioritises expansion of the network to accommodate changes in demand over asset replacement. Finally, APA GasNet suggested that if the AER considered that any proposed asset replacement was not consistent with efficient asset management practices, the AER could choose not to approve the relevant expenditure.

2.4 PwC report

This sub-section discusses the report prepared primarily by Mr Jeff Balchin of PwC (the PwC report).[34] This sub-section outlines both:

- the analytical framework used in the report
- the application of that framework to the VTS.

2.4.1 Framework

The PwC report began by defining the various dimensions of economic efficiency PwC saw as relevant to clause 89(1)(a) of the NGR – allocative,

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32 Revised proposal submission, p.82.

33 Revised proposal submission, p.83.

34 Revised proposal submission – Attachment 6.1 (PwC, *Depreciation of assets under the National Gas Rules, Expert report*, November 2012) (PwC report).

productive and dynamic efficiency.[35] The report suggested that reference prices should signal to consumers the relative scarcity of the resources used to provide the reference services. This would encourage consumers to consume only when their benefits exceed the cost of provision:

> ...the depreciation method should result in prices that signal the resource cost of using the pipeline at any point in time, and so encourage the efficient use of the pipeline at all points in time.[36]

Due to the high fixed costs of pipeline infrastructure, the report noted that prices may need to exceed marginal cost to enable service providers to recover their total costs. Therefore, fixed costs should be spread across consumers in a manner that has least effect on how they would consume services compared to a situation where the consumer paid a price equal to marginal cost.[37]

PwC suggested that in the absence of any capacity constraints and other cost pressures, efficient prices should be stable in real terms over the life of the infrastructure. This is because the inefficiency caused by the mark-up of prices over marginal costs tends to rise in a non-linear manner as the mark-up increases. According to the report, stable real prices should minimise the distortion to demand caused by the recovery of fixed costs.[38]

Where capacity constraints were present or likely, PwC submitted that prices should rise (in real terms) in times of constraints and be lower at times of low system utilisation. Therefore, a reduction of prices at times of capacity constraints cannot increase allocative efficiency; but it may reduce allocative efficiency if it means that prices need to be commensurately higher at a future point in time when capacity constraints have been overcome.[39]

The PwC report went on to illustrate different reference tariff paths for APA GasNet under different assumptions about future capital expenditures.

2.4.2 Application to the VTS

PwC noted that "...the VTS pipeline [sic] is nearing or at capacity in at least one major location." [40]

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35 PwC report, p.7.

36 PwC report, pp.7-8.

37 PwC report, p.8.

38 PwC report, p.9.

39 PwC report, pp.10-11.

40 PwC report, p.15.

PwC cited an AEMO report as saying:

> …that the VTS is constrained in the Melbourne and Geelong Zones, noting that there is "insufficient South West Pipeline capacity" on a 5-year outlook and "insufficient system capacity" on a 10-year outlook. It also noted capacity constraints in the Gippsland zone on a 10 year outlook.[41]

On this basis, the PwC report stated that:

> ...the efficient price for the next access arrangement period would be one that is at least maintained in real terms. Conversely, it would be inefficient to reduce prices for the next access arrangement period – to do so would only exacerbate congestion and leave more of the fixed cost to be recovered when surplus capacity is likely to exist.[42]

As a consequence, PwC considered that APA GasNet's approach to depreciation was more likely to be consistent with clause 89(1)(a) of the NGR than the AER's approach.

Reference tariff scenarios

The PwC report considered four scenarios for future capital expenditure over the next 20 years. The scenarios were as follows:

- *Scenario 1* – base case scenario, which includes that the regulatory rate of return set out in the AER's Draft Decision applies for the 20 year period
- *Scenario 2* – assumes that the regulatory rate of return increases from 2018 onwards as the risk free rate used in the estimate of the cost of equity returns to levels more consistent with a conservative expectation of the future yield on 10 year bonds
- *Scenario 3* – assumes that the WORM project is undertaken, which is primarily a project to maintain system security in the face of growing demand and the changing source of gas production
- *Scenario 4* – is a combination of scenarios 2 and 3, and assumes a higher rate of return and that the WORM project is undertaken.[43]

PwC stated that future costs could be even higher than those modelled for scenario 4. PWC noted the need for expenditure to address changing safety requirements and urban encroachment but did not acknowledge the scope for productivity improvements.

Under all scenarios, the AER's approach produced an immediate sharp fall in reference tariffs of about 30%.

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41 PwC report, p.15.

42 PwC report, p.16.

43 PwC report, pp.17-18.

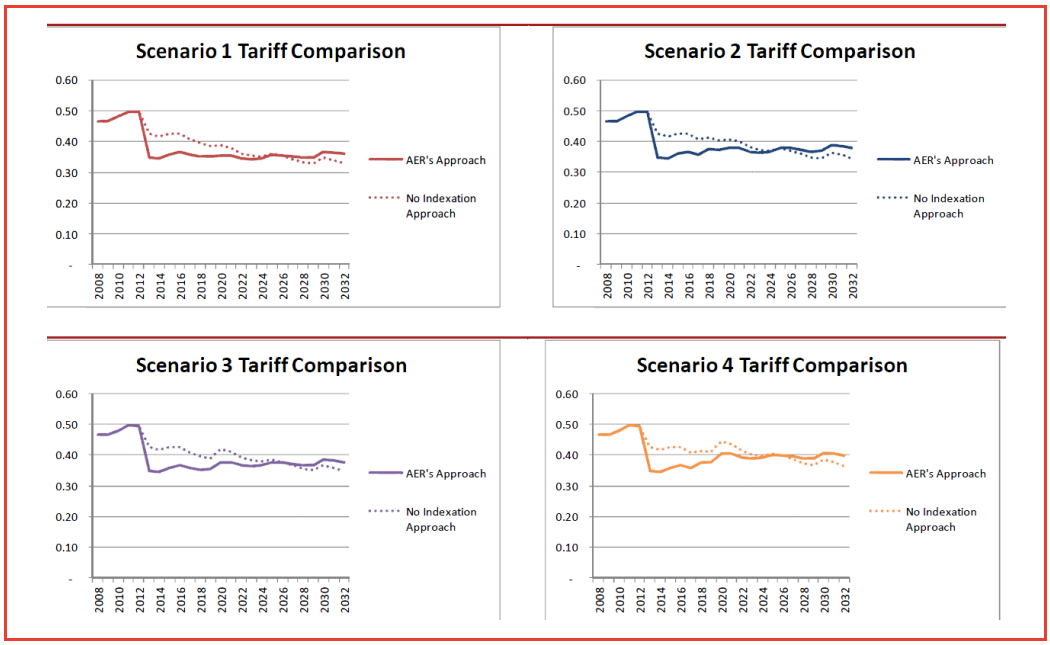
Subsequently:

- In scenarios 1-3, real reference tariffs under the AER approach were broadly flat with small increases of 5-10% in scenarios 2 and 3 over the remainder of the 20 year period
- In scenario 4, the AER approach led to reference tariffs that rose about 15% in real terms over the period 2013 to 2020 and were fairly flat thereafter.

Figure 1 reproduces the tariff paths from the PwC report.

Under all scenarios, the APA GasNet approach also led to reference tariffs falling immediately across all scenarios, but to a lesser degree than under the AER approach. Subsequently, the fall was most pronounced in scenario 1 (about 20% between 2013 and 2032) and least pronounced in scenario 4 (with tariffs fairly steady for the first decade and then falling about 10% by 2032).

Figure 1: Reference tariff path scenarios (real 2012$)



Source: PwC report, p.18.

With reference to these scenarios the PwC report made a number of comments that can be summarised as follows:[44]

- The regulatory WACC was likely to increase in future periods because the risk-free rate was expected to increase from its current extremely low levels. This would tend to increase future reference tariffs other things being equal. Therefore, reference tariff stability would be aided by tariffs not falling substantially in the near terms as they would under the AER's approach.

44 PwC report, pp.19-21.

- Although the AER did not approve the majority of the proposed WORM-related expenditure for the forthcoming access arrangement period, the project was likely to go ahead in a future access arrangement period.
- For these reasons, scenario 4 was the most likely to occur.
- Future capital expenditures were also likely to rise more quickly than reflected in the charts for other reasons, such as:
  - Urban encroachment along pipeline easements reducing the scope for some of the lower-cost augmentation options
  - Rising materials prices raising pipeline augmentation costs
  - Increasing safety requirements.
- Given all of these factors, APA GasNet's proposed approach to depreciation was more likely to lead to reference tariffs that were constant in real terms than the AER's approach.
- If the importance of capacity constraints is set aside, constant real tariffs under APA GasNet's approach would be preferable to rising reference tariffs under the AER's approach.

3 Evaluation of APA GasNet's proposed approach

3.1 Framework

A key question in determining whether APA GasNet's proposed depreciation approach would promote efficient growth in the market for the reference services provided by APA GasNet is whether the approach would be likely to lead to reference tariffs that vary in accordance with the marginal cost of providing these services. Generally speaking, prices for a service in line with the marginal costs of providing the service promote efficient demand for, and use of, that service. Hence, reference tariffs that vary with the marginal cost of reference services should promote efficient growth in the market for the service. To the extent that reference tariffs reflecting marginal cost would not allow the service provider to fully recover its regulated revenues, any remaining revenue should be recovered in a way that minimises the impact on the demand for reference services.

3.1.1 Measurement of marginal cost

The marginal cost of reference services can be determined over different time frames depending on the nature of the usage decision. If the decision concerns the short-term use of reference services to consume gas at a point in time, the relevant timeframe for determining marginal cost should also be the short term. In the short term, the capital investment in the pipeline system is fixed. As a result, the marginal cost of transporting gas through existing gas transmission pipelines will tend to be fairly low except during rare peak demand or outage periods when demand exceeds potential supply.

But when thinking of longer term decisions like investment in new gas-consuming facilities such as gas-fired power stations and industrial plant, it is more appropriate to determine marginal cost in a way that takes account of the likely need for and cost of augmentation to satisfy the growth of demand for the reference services. This concept is referred to as the long-run marginal cost (LRMC) of the reference services.

Given that the growth of reference services is a dynamic concept that needs to be considered over a reasonably long timeframe, it makes sense for reference tariffs to be compared against the LRMC of providing reference services. Therefore, the appropriateness of APA GasNet's approach to depreciation should be evaluated by considering whether it is likely to lead to tariffs that vary in line with the LRMC of providing reference services.

The LRMC of reference services provided by the VTS will vary according to the level of spare capacity on the system and the cost of augmentation required to

meet an increment of demand growth.[45] As these variables may vary across the VTS, the LRMC of reference services will also tend to vary to some extent on a locational basis.

As noted above, APA GasNet's proposed approach to depreciation would likely increase regulatory depreciation in the near term and reduce it in later years relative to under the current real approach. Other things being equal, this would translate into higher reference tariffs in the near term and lower reference tariffs in the longer term than would otherwise be the case.

In our view, whether such changes are appropriate and consistent with the requirements of the NGR fundamentally depend on:

- The current average LRMC of reference services across the VTS and
- Whether the average LRMC is likely to rise, fall or remain fairly steady over the access arrangement period and beyond.

Both of these variables will depend in large part on the nature of existing and approaching capacity constraints and the costs of addressing those constraints relative to historical level of capital expenditure on the VTS. These constraints are discussed in sub-section 3.2.

Importantly, the need for capital expenditure on existing pipeline assets for reasons other than growth in demand for the reference service (such as increased safety requirements) are not relevant to the calculation of LRMC. These expenditures need to be incurred irrespective of the level of or growth in demand for reference services and are hence not avoidable if demand growth is curbed. These costs are only relevant to efficient pricing in so far as they affect the level and stability or otherwise of reference tariffs.

3.1.2 Recovering remaining revenues and the importance of stability

As noted above, setting reference tariffs to reflect marginal cost may not enable a service provider to fully recover its allowed regulated revenues and this can be the case even if tariffs are set to reflect the LRMC of providing reference services.

Setting tariffs to reflect marginal cost may not enable full cost recovery where:

- The relevant infrastructure exhibits strong economies of scale
- Costs arise irrespective of changes in demand or utilisation – for example if increased safety requirements were set.

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45 The cost of augmentation would reflect factors such as urban encroachment and rising materials prices.

Where reference tariffs reflecting LRMC do not enable full cost recovery, remaining revenues should be recovered in a way that minimises the impact on the demand for reference services. This normally requires that the extent to which reference tariffs exceed those necessary to reflect LRMC (ie the 'mark up' of reference tariffs over LRMC) should be stable over time.

Importantly, there is no conflict between maintaining a stable mark-up of reference tariffs over LRMC and allowing reference tariffs to vary over time to reflect changes in LRMC. Both principles can and should be met simultaneously.

3.2 Capacity constraints

3.2.1 APA GasNet contentions

The revised proposal submission, Fothergill statutory declaration and PwC report all contended that the VTS is operating at or close to capacity constraint. This means that incremental growth of demand for gas from the VTS would necessitate costly augmentation. Accordingly, all of these documents suggested that it would be inappropriate to significantly reduce reference tariffs, as would occur under the AER's approach to depreciation.

The Fothergill statutory declaration made the most specific assertions regarding capacity constraints, suggesting that the Northern Zone was operating at maximum capacity and the SWP was also facing constraints. Capacity was forecast to expand on the three key pipeline sections (Northern Zone, SWP and Longford to Melbourne), but forecast peak day demand was also forecast to increase to match or exceed the expected additions to capacity.

Mr Fothergill did not refer to any published or unpublished sources for the capacity and utilisation figures incorporated in Table 1 of his statutory declaration. This makes it difficult to assess their veracity. However, we note that in its original proposal submission, APA GasNet explained that its forecast peak pipeline utilisation on the Longford to Melbourne pipeline was 82-83%,[46] far less than Mr Fothergill's 95-98%.[47]

Mr Fothergill's 1-in-20 peak day demand forecast was taken from Table A1-9 in the AEMO Victorian Gas Declared Transmission System Medium Term Outlook (MTO) for 2011, which was Attachment A1 to AEMO's 2011 Gas Statement of Opportunities (2011 GSOO).[48]

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46 Original proposal submission, Table 5.15, p.69.

47 Fothergill statutory declaration, Table 1, p.3.

48 AEMO, *2011 Gas Statement of Opportunities for Eastern and South Eastern Australia.*

The PwC report referred to AEMO's 2012 Victorian Annual Planning Report (VAPR)[49] in highlighting that the VTS is constrained:

- In the Melbourne and Geelong Zones, with insufficient capacity on the SWP on a 5-year outlook and insufficient system capacity on a 10-year outlook
- In the Gippsland Zone on a 10-year outlook.[50]

The 2012 VAPR relied on peak demand forecasts from the 2011 MTO.[51]

3.2.2 Evolution of peak day demand forecasts

We have examined the 2012 VAPR and forecasts contained in the Fothergill statutory declaration, as well as more recent forecasts from AEMO's 2012 MTO published in November.[52]

We make the following observations:

- Winter 1-in-20 peak day system demand forecasts (medium scenario) in the 2011 MTO[53] were revised down substantially from the 2010 VAPR Update forecast,[54] to the point where the level of 1-in-20 peak day demand forecast for 2013 in the 2010 VAPR was not expected to materialise until beyond 2022 in the 2011 MTO.
- The latest (2012) MTO 1-in-20 peak day demand forecasts are even lower than the 2011 MTO, with the peak demand forecast for 2014 in the 2011 MTO not expected to materialise until 2016 in the 2012 MTO and the peak demand forecast for 2017 in the 2011 MTO now not expected to materialise until 2018 in the 2012 MTO.[55]

See Figure 2 below.

Therefore, the latest MTO continues a trend of downgrading of expected peak growth in gas demand.

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49 AEMO, *2012 Victorian Annual Planning Report, Electricity and Gas Transmission Network Planning in Victoria.*

50 PwC report, p.15.

51 2012 VAPR, Table 5-1, p.5-4.

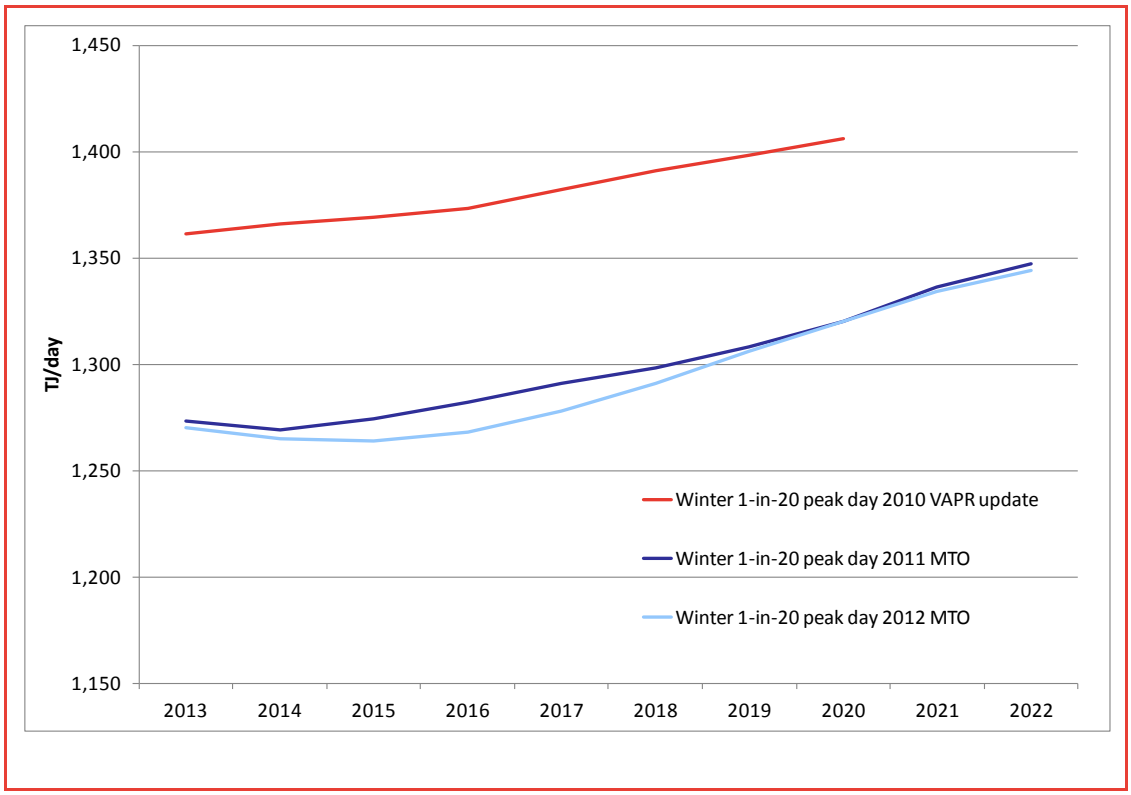
52 AEMO, *2012 Victorian Gas DTS Medium Term Outlook*.

53 See Table A1-9, p.A1-20.

54 See AEMO, *Victorian Annual Planning Report Update, Victoria's Electricity and Gas Transmission Network Planning Document*, 2010, Table 1, p.2, Table 1-3, p.13, Table 1-11, p.22.

55 2012 MTO, Table 2-5, p.12.

Figure 2: Victorian 1-in-20 peak day winter demand



Source: Frontier Economics, based on data contained in the 2010 VAPR Update, 2011 MTO and 2012 MTO, all published by AEMO.

3.2.3 2012 VAPR commentary on VTS constraints and need for network solutions

The 2012 VAPR noted that the locations of constraints on the VTS over the next 10 years largely depend on the size and location of gas-powered generation (GPG) development.[56]

As noted above, the PwC report referred to the 2012 VAPR and suggested that several zones in the VTS were facing constraint on a 5- or 10-year outlook. It is worth analysing these outlooks in more detail.[57]

Melbourne and Geelong Zones

The 2012 VAPR notes that constraints could arise on the SWP on a 5-year outlook, as well as on a 10-year outlook.

56 2012 VAPR, p.v.

57 Note that increased GPG in a particular zone may lead to constraints in a different zone.

Constraints on the SWP on a 5-year outlook would be triggered in AEMO's scenario 2. That is, by new entry of GPG of:

- 500 MW of CCGT in the Gippsland Zone and
- 300 MW of OCGT in the Melbourne Zone.[58]

The combination of these events would cause a minimum pressure breach at Brooklyn. In AEMO's view, the network solutions that could address these constraints include a new compressor station at Stonehaven or commissioning Stage 2 of the WORM project.

Constraints on the SWP on a 10-year outlook would be triggered by new entry of GPG in accordance with any of the following three scenarios examined by AEMO:

- Scenario 3 Metropolitan (M) models total generation of 1,700 MW, with OCGT of 1,200 MW in the Melbourne metropolitan area, with total gas demand of 85 TJ/day
- Scenario 4 La Trobe Valley (LV) models total generation of 2,300 MW, with CCGT of 2,000 MW in the La Trobe Valley, with total gas demand of 339 TJ/day
- Scenario 5 South West (SW) models total generation of 2,700 MW, with OCGT of 600 MW in the South West area, with total gas demand of 40.5 TJ/day.[59]

Any of these scenarios could lead to SWP capacity being constrained by its maximum allowable operating pressure. The VAPR says that assuming the solutions identified in the 5-year outlook are built, possible solutions include increasing the compression capacity at the Stonehaven Compressor Station by adding another compressor and duplicating the SWP from Iona to Stonehaven. Under Scenario 3, there is also the option to duplicate the SWP from Iona to Line Valve No.3 and from Stonehaven to the Lara City Gate.

In our view, the likelihood of any of these scenarios materialising in the next decade is extremely low, as discussed in sub-section 3.2.4 below.

Gippsland Zone

The 2012 VAPR notes that constraints could arise in the Gippsland Zone on a 5-year outlook, as well as on a 10-year outlook.[60] The PwC report only refers to constraints on the 10-year outlook.

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58 2012 VAPR, Table 5-2, p.5-5, also section 5.1.8, p.5-10.

59 2012 VAPR, section 5.1.8, p.5-12.

60 2012 VAPR, Table 5-2, p.5-5, also section 5.1.5, pp.5-6 – 5-7.

Constraints at the Dandenong City Gate would be triggered on a 5-year outlook in AEMO's scenario 1. That is, by new entry of GPG of 600 MW of OCGT in the Melbourne area. This would cause a minimum connection pressure breach at the Dandenong City Gate. The network solution that could address this constraint would be duplicating the unlooped pipeline either upstream or downstream of the Gooding Compressor Station.

Constraints on Longford to Melbourne pipeline would be triggered on a 10-year outlook by new entry of GPG in accordance with AEMO's scenario 4 (LV). This scenario models total generation of 2,300 MW, with CCGT of 2,000 MW in the La Trobe Valley and OCGT of 300 MW in the Melbourne Zone. The network solution that could address this constraint would be duplicating the unlooped pipeline either upstream or downstream of the Gooding Compressor Station.

As with the Melbourne and Geelong Zone constraint, the likelihood of any of the above scenarios materialising over the next decade is extremely low, as discussed below.

Northern Zone

The 2012 VAPR does not identify any constraints arising in the Northern Zone on either the 5- or 10-year outlooks based on the scenarios modelled.

3.2.4 2012 VAPR commentary on likely timing of capacity constraints

All of the scenarios modelled by AEMO to test the longer term scope for constraints on the VTS involve substantial new GPG in the Melbourne and/or Gippsland Zones.

As noted above, the minimum increase in GPG investment that could cause a constraint in accordance with AEMO's 5-year outlooks is as follows:

- In the Melbourne and Geelong Zones: 300 MW of OCGT in Melbourne combined with 500 MW of CCGT in Gippsland – which would cause a minimum pressure breach at Brooklyn
- In the Gippsland Zone: 600 MW of OCGT in Melbourne – which would cause a minimum connection pressure breach at the Dandenong City Gate.

Further, the minimum increase in GPG investment that could cause AEMO's 10-year outlook constraints to bind would be:

- In the Melbourne and Geelong Zones: 1700 MW of OCGT, with 1,200 OCGT in Melbourne – which would trigger constraints on the SWP
- In the Gippsland Zone: 2,000 MW of CCGT in Gippsland combined with 300 MW OCGT in Melbourne – which would trigger constraints on the Longford to Melbourne pipeline.

To assess the likelihood of these scenarios occurring, we first examined AEMO's 2012 GSOO.[61] The forecasts for additional annual gas demand for GPG in the 2012 GSOO were produced using modelling and input assumptions consistent with AEMO's 2012 National Transmission Network Development Plan (2012 NTNDP).[62]

The 2012 NTNDP provided estimates of new GPG by NTNDP zones out to 2036-37 under two modelling scenarios:

- Reference planning (P) scenario – which incorporates a Treasury-derived carbon price that reaches $30/tCO2-e (2012-13 dollars) by 2018/19
- Slow rate of change (SRC) scenario – which incorporates slower demand growth and a carbon price that drops to zero after the initial three-year fixed-price period.[63]

By way of comparison, we note that March 2013 EUA permits in Europe are presently trading at approximately E5.9/tCO2-e (about $A7.48/tCO2-e).[64] Once Australia's carbon pricing scheme enters the flexible price period from 2015/16 onwards, liable parties will be eligible to surrender EUAs in order to discharge their domestic carbon liability.

GPG in the La Trobe Valley NTNDP Zone

As noted above, 500 MW of CCGT in the VAPR Gippsland Zone could help trigger constraints in the Melbourne Zone in the form of a minimum pressure breach at Brooklyn.

Under the P scenario in the 2012 NTNDP, the AEMO found that:

- No additional MW of OCGT would occur in the La Trobe Valley Zone (broadly equivalent to the Gippsland Zone in the VAPR) until 2017-18
- No more than 469 MW of new OCGT would occur in the La Trobe Valley Zone over the entire outlook period.[65]

Under the SRC scenario, only 61 MW of new OCGT capacity would occur in the Gippsland Zone across the entire outlook period.[66]

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61 AEMO, *2012 Gas Statement of Opportunities for Eastern and South-Eastern Australia.*

62 AEMO, *2012 National Transmission Network development Plan, For the National Electricity Market*. See 2012 GSOO, section 3.2.3, p.3-7, section A5-2, p.A-42.

63 2012 NTNDP, section 1.3, p.1-2.

64 See: https://www.theice.com/emissions.jhtml, accessed on 15 January 2013.

65 See NTNDP Electronic Material – Planning Scenario Excel spreadsheet, NEMInstalledCapacity Data tab, row 56; also 2012 NTNDP, Table 2-13, p.2-31.

66 2012 NTNDP, Table 2-13, p.2-31.

No CCGT would be required in Gippsland under any NTNDP scenario for the entire outlook period.[67]

This means that La Trobe Valley GPG investment would not exceed AEMO's partial trigger threshold for a minimum pressure breach at Brooklyn out to 2036-37.

GPG in the NTNDP Melbourne Zone

As noted above, 300 MW of OCGT in the VAPR Melbourne Zone could help trigger constraints in the Melbourne Zone in the form of a minimum pressure breach at Brooklyn. Further, 600 MW of OCGT in the Melbourne Zone would itself cause a minimum connection pressure breach at the Dandenong City Gate.

With respect to new GPG investment in the Melbourne Zone, the 2012 NTNDP found that in its P scenario:

- No additional MW of OCGT would occur in the NTNDP Melbourne Zone until 2022-23
- Only 253 MW of additional OCGT would occur in the Melbourne Zone by 2023-24
- The 300 MW Melbourne Zone OCGT partial trigger (combined with 500 MW of CCGT in the Gippsland Zone, which is not expected to be breached) to cause a minimum pressure breach at Brooklyn in the Melbourne Zone would not be reached until 2024-25
- The 600 MW Melbourne Zone OCGT trigger to cause a minimum connection pressure breach at the Dandenong City Gate would not be reached until 2025-26
- The scenario 3 trigger for constraints on the SWP (1700 MW of OCGT) would not be reached until 2029-30.[68]

As with the Gippsland Zone, no CCGT would be required in the Melbourne Zone for the entire outlook period.[69]

Under the SRC scenario, the 2012 NTNDP found only 210 MW of OCGT in Melbourne by 2026-27 and 1,351 MW of OCGT by 2036-37.[70]

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67 2012 NTNDP, Table 2-13, p.2-31.

68 See NTNDP Electronic Material – Planning Scenario Excel spreadsheet, NEMInstalledCapacity Data tab, row 58; also 2012 NTNDP, Table 2-14, p.2-32.

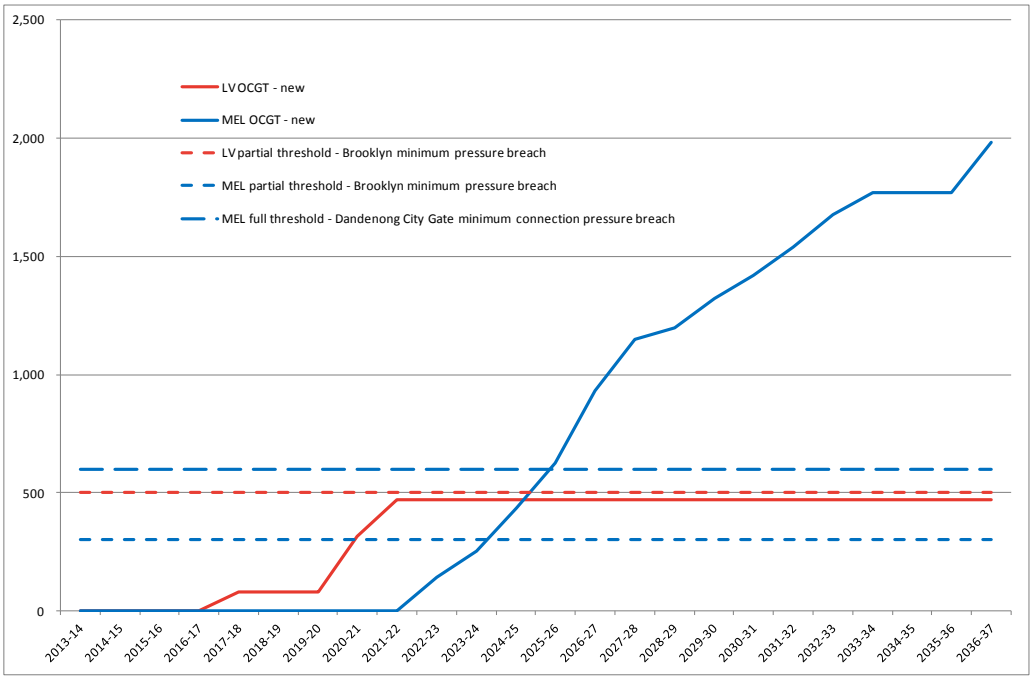
69 2012 NTNDP, Table 2-14, p.2-32.

70 2012 NTNDP, Table 2-14, p.2-32.

Conclusion

Data from the 2012 NTNDP combined with AEMO's analysis in the 2012 VAPR suggests that even under the reference planning (P) scenario, no transmission constraints on the Victorian VTS will require augmentation until 2024-25 at the very earliest.[71] Figure 3 below shows the expected growth in GPG capacity under the P scenario. Under a more realistic carbon price that better reflects current European permit prices, the need for augmentation is likely to be further delayed until the late 2020s.

Figure 3: Expected growth in GPG in Melbourne and the La Trobe Valley



Source: Frontier Economics, based on data contained in the AEMO 2012 NTNDP

In this context, we find it is difficult to accept that the VTS is at or near capacity constraints. As a result, we consider that the average LRMC of access to the VTS is relatively low at the present time, although it is likely to gradually rise from the early 2020s – late into the access arrangement period after the one about to commence. In accordance with the need to promote efficient growth in the market for reference services, the level of APA GasNet's reference service tariffs should reflect these circumstances.

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71 Conservatively assuming that constraints on the SWP pipeline would be triggered by new OCGT in Melbourne and Gippsland combined exceeding 800 MW rather than just by 500 MW of CCGT in Gippsland combined with 300 MW of OCGT in Melbourne.. Otherwise, the earliest date augmentation would be triggered would be 2025-26.

3.2.5 Constraints in the Northern Zone

The Fothergill statutory declaration suggested that the Northern Zone was operating at maximum capacity and the SWP was also facing constraints. The 2012 AEMO VAPR did not identify any impending constraints in the Northern Zone based on the scenarios modelled. However, these scenarios did not take account of demand for capacity to facilitate gas exports to New South Wales through Culcairn. We understand that retailers prefer to source gas for export from the Otway Basin rather than from Longford despite the spare capacity on the Longford pipeline. This places pressure on the SWP and between Wollert and Wodonga.

The only information provided on Northern Zone constraints is from the statutory declaration of Mr Fothergill. As noted above, Mr Fothergill did not provide any substantiation for his claim that the Northern Zone was and would continue to operate at close to capacity for the foreseeable future. As a result, it is difficult to assess the veracity of those claims.

Nevertheless, if constraints arose in the Northern Zone due to NSW export demand, this would suggest that the LRMC of serving peak day demand from Northern Zone and export customers is relatively high. However, we understand that APA GasNet has scope to rebalance tariffs by charging higher reference tariffs to Northern Zone and export customers (and lower tariffs to customers elsewhere) within the bounds of its overall revenue cap. We note that even assuming forecast peak day NSW export demand reaches 68 TJ (as set out in Table 1 in the Fothergill statutory declaration), and assuming native Northern Zone peak day demand approaches 120 TJ,[72] this compares with over 1,140 TJ[73] of remaining native peak day demand on the VTS. Therefore, the proportion of peak day demand on the VTS that ought to face high tariffs to reflect the relatively high LRMC of serving that demand is only about 14% of aggregate peak day demand. Hence, even though the AER's approach to depreciation would lead to lower *average* reference tariffs in the short term than APA GasNet's approach, this should not prevent APA GasNet from setting high tariffs specifically for NSW export and Northern Zone customers to reflect the relatively higher LRMC of serving demand from those customers.

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72 See AEMO 2012 MTO, Table 2-7, p.14.

73 Calculated by subtracting Northern Zone peak day demand from overall system demand in AEMO 2012 MTO, Table 2-7, p.14.

3.2.6 Could required investment be accommodated within the existing spend?

If and when constraints on the VTS need to be addressed through augmentation, there are good reasons for thinking that the costs and timing of such investment will not have a large impact on the overall LRMC of the network and hence on the efficient level of average tariffs for reference services.

Relative costs of required investment

Even if capital expenditure on the VTS is required to address capacity constraints sooner than expected based on the GPG projections in the 2012 NTNDP – say, during the 2018-22 access arrangement period – this would not imply that the average LRMC of VTS usage would suddenly become high. The extent to which the LRMC of network usage would rise prior to the need for augmentation would depend on the costs of addressing those constraints relative to historical levels of augmentation capital expenditure. If the level of expenditure required to address constraints is relatively small, the LRMC of network usage may remain fairly low even just prior to the need for investment. Therefore, it is worth examining the likely costs of addressing the potential VTS constraints highlighted in the 2012 VAPR.

As noted above, a minimum pressure breach at Brooklyn in the Melbourne Zone could be addressed by either:

- A new compressor station at Stonehaven
- Commissioning Stage 2 of the WORM project.

Neither of these projects is particularly expensive relative to historical level of capital expenditure or capital expenditure for the coming access arrangement period approved by the AER in its Draft Decision.

For example:

- A new T60 compressor at Stonehaven would cost about $38.3 million[74]
- Stages 2 and 3 of the WORM project would cost about $95 million.[75]

These figures compare with augmentation capital expenditure of:

- $92.1 million (in 2012$) in the 2008-12 access arrangement period[76] and

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74 See Sleeman Consulting, *Victorian Transmission System, Review of Gas to Culcairn Project and Western Outer Ring Main Project, Public Version*, 25 July 2012 (Sleeman Consulting report), pp.25, 37.

75 Sleeman Consulting report, pp.37-38, 42. The APA GasNet original proposal submission suggested $97.4 million (p.100).

76 Draft Decision, Table 3.1, p.24.

- $84.5 million (in 2012$) approved by the AER in its Draft Decision for the 2013-17 access arrangement period.[77]

Tariff path scenarios discussed in the PwC report

As discussed in sub-section 2.4.2, the PwC report compared the path of reference tariffs under the APA GasNet and AER approaches to depreciation under four scenarios. In scenarios 1-3, real reference tariffs under the AER approach were broadly flat after an initial fall with small subsequent increases in scenarios 2 and 3. In scenario 4, the AER approach led to reference tariffs that subsequently rose about 15% in real terms over the period 2013 to 2020 and were fairly flat thereafter.

We note that the 'non-WORM' tariff path scenarios (1 and 2) discussed in the PwC report already allow for substantial capital expenditure in the 2018-2022 period. In particular, both allow for a similar or the same level of real net capital expenditure as the AER has provisionally approved for the 2013-17 access arrangement period (that is, $153.8 million in 2012$).[78]

Therefore, the 'WORM-inclusive' tariff path scenarios (3 and 4) assume that the costs of completing the WORM project in the 2018-22 period are *wholly additional* to the capital expenditure that would otherwise be required over this period. However, neither PwC nor APA GasNet provided any evidence of what other projects or works would need to be undertaken over this period. In the absence of supporting information or data, the assumption that WORM-related expenditure would be wholly additional to baseline capital expenditure suggests double-counting of expenditure and as such is unjustified. This means that the slight upward trajectory of real tariffs under the AER's approach to depreciation in scenarios 3 and 4 of the PwC report lacks credibility even if completion of the WORM project is required in the 2018-22 period. In our view, it is far more likely that under the AER's approach to depreciation, real reference tariffs are likely to remain fairly flat (after the initial downward adjustment to reflect low average LRMC) over the next ten years-plus, even if the WORM project is completed during that period. At most, scenarios 3 and 4 could be used to provide an indication of reference tariffs assuming a 20% increase[79] in real capital

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77 Draft Decision, Table 3.2, p.24.

78 See AER GasNet – PTRM Excel spreadsheets, Input tab.

79 The 20% figure is calculated as follows: In scenarios 3 and 4, the WORM project is assumed to add approximately $92.6 million (in 2012$) to capital expenditure over the 2018-2022 access arrangement period, increasing it from $153.8 million (in 2012$) to $246.4 million (in 2012$). Assuming (as PwC does) that capital expenditure in the 2023-2027 and 2028-2032 access arrangement periods remains at $153.8 million (2012$) each in the absence of any real cost increase, the differences between scenarios 3 and 1 and between 4 and 2 is broadly equivalent to a 20% increase in total real capital expenditure over the entire period 2018 to 2032 compared with the 2013-17 period. Therefore, comparing scenarios 3 and 4 to scenarios 1 and 2 (respectively) can

expenditure costs due to the other reasons mentioned by PwC – namely, urban encroachment, rising materials prices and increasing safety requirements. This demonstrates that even with such steeply rising assumed real costs, real tariffs would rise only gradually under the AER's approach to depreciation. This would be consistent with the gradually rising average LRMC of the network over this period.

Therefore, it appears that:

- Given that the average LRMC of overall network usage will remain relatively low until the end of this decade and then gradually rise from the early 2020s, reference tariffs based on the AER's approach to depreciation will better reflect LRMC than tariffs based on APA GasNet's proposed approach, which slide substantially over the outlook period.
- Tariffs based on the AER's approach to depreciation are on average lower than tariffs based on APA GasNet's approach to depreciation until about 2025-26. From that point onwards, tariffs under APA GasNet's approach would be lower.

In light of the issues discussed in this report, we consider these outcomes support our view that APA GasNet's proposed approach would not lead to reference tariffs varying, over time, in a way that promotes efficient growth in the market for reference services.

3.3 Level and volatility of tariffs

Subject to reference tariffs appropriately reflecting the average LRMC of system usage, any remaining regulated revenues should be recovered in a way that minimises the impact on the demand for reference services. This normally requires that the mark-up of reference tariffs over LRMC should be stable over time.

In the present case, we have noted that the average LRMC of overall network usage will remain relatively low until the end of this decade and then start to rise gradually. This implies that after an initial fall to reflect the prevailing low average low LRMC across the VTS, reference tariffs should remain relatively stable and then start to rise towards the early 2020s in real terms.

In this context, we note that the projected indicative tariffs set out in Figure 6.1 of APA GasNet's revised proposal submission are provided in nominal terms. Therefore, they provide no support to APA GasNet's proposition that its

provide a rough indication of the change in real reference tariffs due to a 20% real increase in capital expenditures from 2013-17 to subsequent periods.

approach to depreciation would provide a more stable tariff path over time in a way that will promote efficient growth in the market for reference services.[80]

Given that we believe there is unlikely to be a need for substantially higher-than-historical levels of capital expenditure over at least the next 10 years, we consider that the AER's approach to depreciation is likely to yield more stable real tariffs than APA GasNet's proposed approach. This is appropriate given the relatively low average LRMC of the network over this period. Focussing on the real tariff path scenarios charted in the PwC report, we note that following an initial and appropriate decrease, real tariffs follow a flatter trajectory under the AER's approach than under APA GasNet's approach. As discussed above, we do not think scenarios 3 and 4 are credible given the lack of justification for the very high WORM-related capital expenditures they incorporate.

To the extent that capital expenditures in the future will be higher than assumed in PwC's scenario analysis for other reasons (urban encroachment, rising materials prices and increasing safety requirements), this will tend to increase real tariff paths under both approaches to depreciation. To the extent this is due to urban encroachment and rising materials prices, it will have the effect of raising LRMC in the long term, as these changes will have a particular impact on the costs of augmentations. But even with a 20% increase in real capital expenditure beyond 2017, the tariff path under APA GasNet's approach to depreciation would maintain a downward trajectory, despite the rising LRMC of the network.[81] By contrast, the tariff trajectory under the AER's approach would start to rise slightly, in line with rising LRMC. In any case, APA GasNet has not provided any real evidence that cost increases of anything like this magnitude are likely to occur.

80 Revised proposal submission, pp.75-76.

81 The cost of dealing with increased safety requirements is probably not relevant to LRMC as such expenditure does not depend on demand growth.

4 Comments on AER reasoning

Sub-section 2.2 outlined the AER's grounds for rejecting APA GasNet's proposed approach to depreciation in its original proposal submission. While section 3 of this report has set out our analysis of the two approaches to depreciation in detail, for the sake of completeness, we offer some brief comments on the AER's reasoning below.

4.1 Inefficient asset utilisation

We agree with the AER that APA GasNet's approach to depreciation would lead to inefficient growth in the market for reference services. APA GasNet's approach would unnecessarily discourage growth in gas demand over the next 5 to 10 years while the LRMC of VTS usage remained relatively low. This could promote continued underutilisation of substantial portions of the VTS, especially the key Longford to Melbourne pipeline.

4.2 Unnecessarily high prices in the short to medium term

We agree with the AER that APA GasNet's approach to depreciation would lead to unnecessarily high prices in the short to medium term, at least in certain parts of the VTS. According to the original access arrangement, reference transmission tariffs for withdrawals in the Metro South East and North West Zones are expected to be more than double what they are in the La Trobe Zone and the Geelong Zone.[82] Given that no new investment is likely to be required to meet Melbourne demand for more than the next decade, it is difficult to see why such differentials should be maintained over at least the next access arrangement period.

4.3 Inefficient management of assets

The AER considered that APA GasNet's proposed approach to depreciation could produce perverse incentives on APA GasNet to replace assets sooner than otherwise or sell assets where the potential sale price exceeds the depreciated historical cost of the capital base. In response, APA GasNet suggested that these risks were effectively negligible.

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82 *APA GasNet Australia (Operations) Pty Ltd, Access Arrangement, Effective 1 January 2013 to 31 December 2017*, Public, March 2012 (Original access arrangement), section A.3, p.27.

We are inclined to consider that APA GasNet's approach to depreciation may create some risks for inefficient asset management. While it is true that the AER has the ability to refuse approving replacement expenditure, the AER would face this decision after APA GasNet has already disposed of the asset. Therefore, to the extent that the asset in question provides benefits in excess of its replacement costs, the AER may be forced to approve the replacement expenditure even if the disposed asset was sold inappropriately. Such an outcome would not be in customers' long term interest. At the same time, we accept that such instances of 'gaming' may be rare.

5 Conclusion

In light of the hefty downward revisions to peak day gas demand forecasts made in recent AEMO publications, we consider it is reasonable and efficient for reference tariffs to fall immediately to reflect the prevailing degree of average available spare capacity on the VTS now and over the next decade. This would promote efficient growth in the market for reference services. The AER's approach to depreciation would achieve these near-term reference tariff reductions to a much greater extent that APA GasNet's proposed approach. Further, real reference tariffs under the AER's approach would begin to exceed tariffs under APA GasNet's approach precisely at the time the LRMC of VTS usage will be rising. In contrast, tariffs under APA GasNet's approach would be falling even as the average LRMC across the network is rising. Therefore, we consider that unlike the AER's approach, APA GasNet's proposed approach would not lead to reference tariffs varying, over time, in a way that promotes efficient growth in the market for reference services in accordance with the requirements of the NGR.

Appendix A – Frontier Economics capability

Frontier Economics is an economic consultancy firm based in Melbourne and Sydney, with associated offices in London, Cologne, Madrid and Brussels.

Frontier Economics has been providing independent advice to businesses, regulators and governments for over thirteen years and have worked extensively in most major sectors of the economy. We have particular expertise in electricity, gas, competition law, water, media, telecommunications, and natural resources.

Frontier is recognised internationally as a leading source of economic, market and regulatory advice for the energy sector. We have worked extensively in the energy sector across all Australia States and also in New Zealand, Singapore, Malaysia and elsewhere in Asia. Our experience spans all aspects of policy design and implementation, market design and modelling, economic regulation, economic evaluation, transaction support, competition assessment and peer review.

FRONTIER ECONOMICS | MELBOURNE | SYDNEY
Frontier Economics Pty Ltd 395 Collins Street Melbourne Victoria 3000
Tel: +61 (0)3 9620 4488 Fax: +61 (0)3 9620 4499 www.frontier-economics.com
ACN: 087 553 124 ABN: 13 087 553 124