Rejoinder to APA GasNet response

A REPORT PREPARED FOR THE AUSTRALIAN ENERGY REGULATOR

February 2013

Rejoinder to APA GasNet response

Contents

Rejoinder to APA GasNet response

Tables and figures

1 Introduction

Frontier Economics has prepared this report for the Australian Energy Regulator (AER) as a rejoinder to APA GasNet's response to our January 2013 report (original report) on APA GasNet's proposed approach to depreciation for the Victorian gas transmission system (VTS).

This Rejoinder report responds to comments made in the following documents (all dated 5 February 2013):

- Letter from Mr Peter Bolding of APA Group to Mr Anthony Bell of the AER (Bolding letter)
- Statutory declaration of Mr Mark Fothergill (Fothergill supplementary declaration)
- Letter from Mr Jeff Balchin of PwC to Mr Peter Bolding of APA GasNet (PwC letter)

In preparing this report, we have had regard to the same materials as in our original report, as well as the following materials:

- AEMO, *Victorian Gas Planning Approach* (AEMO Planning Approach)
- AEMO, *Victorian Gas Declared Transmission System Capacity* (2012 Capacity report)
- AEMO, *2009 Victorian Annual Planning Report* (2009 VAPR)
- AEMO, *2009 Victorian Annual Planning Report Update* (2009 VAPR Update)
- AEMO, *2010 Victorian Annual Planning Report* (2010 VAPR)
- AEMO, *2010 Victorian Annual Planning Report Update* (2010 VAPR Update)
- AEMO, *2011 Victorian Annual Planning Report* (2011 VAPR)
- APA Group, *Response to the Commission's draft decision*, 20 December 2007
- ACCC, *Revised access arrangement by GasNet Australia (Operations) and GasNet (NSW) for the Principal Transmission System, Final Decision*, 30 April 2008.

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.

This Rejoinder report is structured as follows:

- Section 2 addresses the question of VTS spare capacity
- Section 3 addresses the question of future GPG demand scenarios
- Section 4 comments on the question of APA GasNet's ability to rebalance its tariffs

- Section 5 addresses the question of the LRMC of the VTS
- Section 6 concludes by commenting on whether APA GasNet's proposed depreciation approach would satisfy the Rule 89 criteria.

Introduction

2 Spare capacity on the VTS

The degree of spare capacity on the VTS is important to assessing APA GasNet's proposed approach to depreciation in so far as it influences the average long-run marginal cost (LRMC) of the VTS. The fact that APA GasNet's depreciation approach is likely to lead to average reference tariffs significantly exceeding and then failing to track changes in the average LRMC of the VTS is central to our view that APA GasNet's proposed depreciation approach does not satisfy the requirements of Rule 89(1)(a) of the NGR.

2.1 APA GasNet contentions

The Bolding letter says that the original Frontier report incorrectly concluded that the VTS has material surplus capacity on the basis of demand forecasts in AEMO's 2012 MTO. The Bolding letter notes that the MTO peak day demand forecast only includes demand from Tariff D and V customers and excludes demand from gas-powered generation (GPG), exports and gas withdrawn through Iona.[1]

The Bolding letter contends that there is no material spare capacity on the VTS because the VTS is only designed with sufficient spare capacity to meet the minimum design requirement set by AEMO – that is, to meet a 1-in-20 year peak day demand.[2]

In support of this point, the Fothergill supplementary declaration says:

- On NSW demand for exports: Since October 2012 (the installation of Euroa compressor), APA GasNet has sufficient export capacity to meet firm obligations but not enough to meet demand for as-available services. For 2015-17, firm obligations will increase by 30TJ/day, to 68 TJ/day.[3] APA GasNet has prepared an optimised expansion plan to cater for this.[4]
- On GPG: AEMO requires VTS be designed to provide at least 25 TJ/day on a 1-in-20 peak day. The 2012 Capacity report shows that assuming GPG of 25/TJ day, GPG would be curtailed when VTS system demand plus NSW exports exceeded 1305 TJ/day. The 2012 Capacity report also shows that currently 220 TJ/day GPG is connected to the VTS, meaning that a

1 Bolding letter, p.2.

2 Bolding letter, p.2.

3 Fothergill supplementary declaration, para 11, p.3.

4 Fothergill supplementary declaration, para 12, p.3.

significant quantity of GPG demand would be left unserved on system peak days.[5]

The Fothergill supplementary declaration went on to say that assuming:

- 1-in-20 year peak system demand from the 2012 MTO
- NSW exports rise from 46 TJ/day to 68 TJ/day in 2015 in line with the planned expansion
- GPG is capped at 25 TJ/day
- VTS capacity is boosted by 61 TJ/day in 2015 due to Winchelsea compressor

The VTS will operate at:

- 99% capacity in 2013
- 98% capacity in 2014
- 96% capacity in 2015
- 96% capacity in 2016 and
- 97% capacity in 2017.[6]

By 2017, the Fothergill supplementary declaration claimed that system capacity would be insufficient to meet forecast demand without the Winchelsea compressor.[7]

2.2 Frontier response

2.2.1 Peak demand conditions

The Bolding letter and Fothergill supplementary declaration described the VTS as capacity constrained by reference to the projected level of VTS capacity utilisation under 1-in-20 year peak day system demand conditions combined with a number of other assumptions.

We note that 1-in-20 year peak day system demand conditions are, by definition, extremely rare, representing a 5% Probability of Exceedance (POE) event. The only 1-in-20 peak day recorded to date is 17 July 2007, when system demand reached 1,258 TJ and GPG demand approached 25 TJ. For the five years 2008-2012 (inclusive), actual peak day system demand failed to reach even the 1-in-2 year forecast made in the previous year. Indeed, as explained in the Bolding

5 Fothergill supplementary declaration, paras 13-14, p.3.

6 Fothergill supplementary declaration, para 17, pp.3-4 including Table 2.

7 Fothergill supplementary declaration, para 18, p.5.

letter, APA GasNet itself uses the 1-in-2 year peak demand forecasts for tariff-setting purposes.

Further, the Fothergill supplementary declaration points out that existing GPG-connected demand on the VTS is equivalent to approximately 200 TJ/day. However, it does not acknowledge that high levels of GPG usually operate on hot days in summer, when gas system demand is relatively low. Indeed, the 2012 Capacity report mentions the 220 TJ/day figure only in context of discussing spare *summer* capacity for GPG in section 4.3, not in the context of discussing spare *winter* capacity in section 4.2.[8]

Therefore, APA GasNet is effectively contending that the VTS is capacity constrained because on one day in twenty years, some GPG *may* need to be curtailed due to simultaneously high gas and electricity demand. We do not consider such a suggestion is credible or sustainable in any practical sense given the commercial and regulatory environment in which APA GasNet operates. The real test of whether a network is operating at or close to capacity in any meaningful sense – and especially in the context of determining the LRMC of the VTS – is whether augmentation is presently occurring or would be justifiable on a reasonable economic or technical basis. This is discussed below.

2.2.2 Investment triggers

1-in-20 peak demand standard and the planning role of AEMO

The Bolding letter states that the 1-in-20 year peak day system demand forecast is: "the standard used for planning purposes, in line with AEMO design requirements".[9] While AEMO is obliged under the NGR to publish annual planning reviews each year,[10] we find no evidence that AEMO imposes any such design requirements on the VTS. AEMO's Planning Approach document explicitly states that:

> In Victoria, AEMO's role and functions are defined by the [National Gas Law], and ***AEMO has no power to require or direct investment in the gas DTS***, as it is required to do for the Victorian electricity Declared Shared Network[11] [Emphasis added]

Further, as confirmed during discussions with AEMO staff, APA GasNet is not obliged to augment the VTS based on 1-in-20 year peak day system demand conditions, or indeed any other reliability-based rule.

---

8 2012 Capacity report, pp.4-2–4-4.

9 Bolding letter, p.2.

10 NGR, Rule 323.

11 AEMO Planning Approach, p.1-1.

AEMO's key contribution to VTS system planning is the preparation of the Victorian Annual Planning Reports (VAPRs). As discussed extensively in section 3.2.4 of our original report, an examination of the 2012 VAPR in the context of more up-to-date GPG forecasts prepared by AEMO reveals that very little VTS augmentation is likely to be required over the next decade or longer (other than to supply NSW exports). As discussed in our original report, the relatively high LRMC of serving NSW export demand can be addressed within the context of the AER's depreciation approach by APA GasNet rebalancing its reference tariffs accordingly. The revised GPG forecasts prepared by AEMO are discussed in more detail in section 3 below.

1-in-20 peak demand standard and NGR augmentation criteria

On the basis that augmentation of the VTS is a matter solely for APA GasNet, the question becomes whether Rule 79 of the National Gas Rules (NGR) justifies capital expenditure to meet hypothetical extreme levels of forecast peak demand.

While this is ultimately a matter for the AER, our view is as follows.

In addition to satisfying the prudency requirements of Rule 79(1)(a), Rule 79(2) states that:

> Capital expenditure is justifiable if:
>
> (a) the overall economic value of the expenditure is positive; or
>
> (b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or
>
> (c) the capital expenditure is necessary:
>
> (i) to maintain and improve the safety of services; or
>
> (ii) to maintain the integrity of services; or
>
> (iii) to comply with a regulatory obligation or requirement; or
>
> (iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or
>
> (d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

In our view, an augmentation undertaken solely to allow extreme peak day levels of demand to be satisfied would be highly unlikely to satisfy sub-clauses (a), (b), (c)(i), (c)(iv) or (d). The remaining question is whether such an augmentation could be justified under sub-clauses (c)(ii) or (c)(iii). As noted above, we understand that sub-clause (c)(iii) does not apply to APA GasNet. This leaves sub-clause (c)(ii).

Spare capacity on the VTS

In its 2007 access arrangement submission in response, GasNet sought to justify a share of its augmentation capital expenditure required to maintain minimum system pressures on the basis of the need to maintain system safety and integrity under clause 8.16(2)(ii)(C) of the former National Gas Code.[12] The system integrity part of this provision is similar to the current Rule 79(2)(c)(ii). GasNet contended that in a market carriage system such as the Victorian gas market and under the Market System Operation Rules (MSOR), capital expenditure was justifiable for system integrity reasons if it was necessary to provide sufficient capacity to meet demand. [13]

In its final decision, the ACCC rejected this interpretation of clause 8.16(2)(ii)(C) as follows:

> The ACCC does not accept that it follows that the market carriage system and MSO rules require that there be sufficient capacity to accommodate all gas demand. As GasNet has noted, VENCorp will accept all gas for delivery subject to the requirement of maintaining system security and safety as required by the MSO rules. In the event that demand exceeds the capacity on parts of the network and there is a threat to system security and safety, VENCorp as the operator of the PTS, is required to control the operation and security of the PTS. This includes reducing users' supply back to their AMDQ/credit allocation (this requires operating the system to ensure there is no minimum pressure breach)….
>
> Accordingly, the ACCC notes that under the market carriage system, users who access the PTS during peak periods will incur some of the costs of congestion, thereby modifying users demand to facilitate balancing demand and supply on the PTS. In the event that there is a demand imbalance, users will be interruptible in accordance with VENCorp's guidelines as discussed above.[14]

We agree with the ACCC's view that the system integrity test in the NGR does not and should not in itself justify augmentation capital expenditure to meet the highest foreseeable levels of demand.

For these reasons, we maintain our view that other than the need to accommodate growing NSW export demand (and provide appropriate signals to this demand, which can be addressed through tariff rebalancing), the VTS generally exhibits a significant degree of spare capacity.

---

12 Clause 8.16(a)(ii)(C) referred to investment required to meet, inter alia, the integrity of services.

13 APA Group, *Response to the Commission's draft decision*, 20 December 2007, pp.5-6.

14 ACCC, *Revised access arrangement by GasNet Australia (Operations) and GasNet (NSW) for the Principal Transmission System, Final Decision*, 30 April 2008, p.38.

3 Future GPG demand scenarios

The key driver of the need for and timing of VTS augmentation is the expected path of new GPG investment in Victoria. We note that the 2012 VAPR states:

> Gas DTS constraints and their possible network solutions can [also] differ, depending on the scenarios analysed, and over the next 10 years the locations of gas DTS constraints largely depend on the size and location of GPG development.[15]

As noted above, section 3.2.4 of our original report suggested that the scenarios for GPG development in the 2012 VAPR were unlikely to materialise within the timeframes stipulated.

3.1 APA GasNet contentions

In response to the discussion of likely future GPG in our original report, the Bolding letter states:

> APA GasNet queries whether it is within Frontier Economics' expertise to question AEMO's view of possible future system constraints. AEMO is the independent market planner and would appear to be better placed than Frontier to form a view as to where future system constraints are likely to arise.[16]

3.2 Frontier response

Our original report clearly explained that we drew on AEMO's own updated forecasts for GPG from the 2012 GSOO and 2012 NTNDP to question the timing of potential augmentations identified in the 2012 VAPR. Importantly, we did not question the *location* of future VTS constraints as suggested in the Bolding letter; we only questioned their *timing* due to the major recent reductions in forecast GPG development.

We draw the AER and APA GasNet's attention to the following points:

- The 2012 VAPR stated that the 5-year and 10-year GPG scenarios used for modelling the likelihood of constraints on the VTS were developed by AEMO from the modelling undertaken for the 2011 NTNDP.[17]

15 2012 VAPR, p.5-2.

16 Bolding letter, p.2.

17 2012 VAPR, p.5-3.

- According to AEMO, the 2011 NTNDP built on the work undertaken in the 2010 NTNDP, "by providing additional information relating to the 2010 results."[18] AEMO reiterated by saying:

  > The 2011 NTNDP involved a detailed examination on the results from 2010, and so did not contain a new scenario-based generation and transmission assessment.[19]

  Therefore, the GPG scenarios used in the 2012 VAPR drew on GPG modelling from the 2010 NTNDP.

- The 2012 NTNDP explained the equivalence between the scenarios modelled in the 2010 NTNDP and the 2012 NTNDP – in particular:
  - The 2012 NTNDP Planning (P) scenario is broadly equivalent to
  - The 2010 NTNDP Decentralised world, medium carbon price (DW-M) scenario.[20]

- Given this equivalence, we note that by 2021/22 (by way of illustration):
  - In the Melbourne Zone:
    - The 2010 NTNDP SW-M scenario had 2,400 MW of GPG (all OCGT) by 2021/22 compared with
    - The 2012 NTNDP P scenario had no new GPG by 2021/22
  - In the La Trobe Valley Zone:
    - The 2010 NTNDP DW-M scenario had 1,500 MW of GPG (all CCGT) by 2021/22 compared with
    - The 2012 NTNDP P scenario had 469 MW of GPG (all OCGT) by 2021/22.

- In other words, the GPG scenarios discussed in the 2012 VAPR are based on projections of GPG development that are not only two years out of date, but are substantially higher than AEMO's GPG projections from the latest (2012) NTNDP.

In conclusion, our original report did not second-guess AEMO's view of future system constraints. Our report simply discussed the likelihood and timing of the quantities of future GPG required to trigger constraints on the VTS. We maintain our view that the volume of GPG needed to trigger transmission constraints in the manner outlined in the 2012 VAPR is unlikely to materialise until 2024/25 at the very earliest.

---

18 2012 NTNDP, p.1-1.

19 2012 NTNDP, footnote 12, p.2-19.

20 2012 NTNDP, Table 5-4, pp.5-8 – 5-9.

Moreover, given developments in carbon pricing both in Australia and internationally, we expect that even the GPG projections contained in the 2012 NTNDP P scenario are likely to be too high. If the Slow Rate of Change (SRC) scenario comes to pass, constraints on the VTS requiring augmentation may not arise until the 2030s.

4 Tariff rebalancing

Our original report suggested that to the extent the LRMC of serving demand from Northern Zone and export customers was relatively high, APA GasNet could rebalance its tariffs to charge those customers higher reference tariffs and charge customers elsewhere lower reference tariffs. We noted that due to the magnitude of Northern Zone and export peak demand relative to remaining Victorian demand, the application of the AER's approach to depreciation should not prevent APA GasNet from setting higher tariffs to Northern Zone and export customers to reflect the relatively high LRMC of serving demand from those customers. Customers elsewhere could receive lower tariffs reflecting the relatively low LRMC of the rest of the VTS.

4.1 APA GasNet contentions

The Bolding letter submitted that the scope for APA GasNet to rebalance its tariffs is very limited given the tariff variation mechanism that applies under its Access Arrangement.[21]

4.2 Frontier response

As noted in section 3.2.5 of our original report, even if peak day NSW export demand reaches 68 TJ (as set out in Table 1 of the Fothergill statutory declaration) and assuming native Northern Zone peak day demand approaches 120 TJ, this combines to only 188 TJ compared to over 1,140 TJ of remaining native peak day demand on the VTS. Therefore, the proportion of peak day demand on the VTS that ought to face relatively high tariffs is only 14% of aggregate peak day demand.[22]

We note that the AER's Draft Decision approved APA GasNet's proposed continuation of its existing tariff design and locational tariff zones.[23] The existing tariff design imposes charges according to actual flows by users rather than capacity reservation, with charges for injections based on peak day injections. APA GasNet's tariff design also incorporates 25 withdrawal zones, including several export zones (which includes exports to NSW at Culcairn). We note that the AER assessed and approved this large number of withdrawal zones as proposed by APA GasNet specifically because it facilitates greater cost-

21 Bolding letter, p.3.

22 Derived as follows: (188/(188+1,140))*100 = 14.16%.

23 AER, *Access arrangement draft decision, APA GasNet Australia (Operations) 2013-17, Part 2 – Attachment*, September 2012, section 10.4.

reflectivity.[24] Further, according to the Draft Decision, APA GasNet appears to allocate the direct costs of new assets to particular zones in order to promote cost reflectivity.

Given its tariff design and its focus on cost reflectivity, we consider that it should be quite feasible for APA GasNet to maintain relatively high reference tariffs to Northern Zone and NSW export customers while lowering reference tariffs to all other customers connected to the VTS.

24 AER Draft Decision section 10.4.4.

Tariff rebalancing

5 LRMC

Establishing the true LRMC of the VTS is crucial to our assessment of APA GasNet's proposed depreciation approach. As noted above, the fact that APA GasNet's depreciation approach is likely to lead to average reference tariffs significantly exceeding and then failing to track changes in the average LRMC of the VTS is central to our conclusion that APA GasNet's depreciation approach does not satisfy the NGR.

5.1 APA GasNet contentions

The Bolding letter contends that there was no basis in the original Frontier report for us to conclude that the LRMC of supply on the VTS is low, nor did we seek to quantify the reduction in LRMC.

The PwC letter suggests that based on the Fothergill supplementary declaration, utilisation of the VTS is high and accordingly there was no basis for saying that the LRMC is currently low and likely to rise gradually over time. PwC says that as utilisation is high and likely to remain high, a better approach would be to assume that marginal cost is not expected to alter substantially over time and to adopt a depreciation approach that results in reference tariffs that are constant in real terms.[25] PwC says that on this criterion, the AER's approach to depreciation would lead to reference tariffs rising in real terms across all scenarios, and by nearly 10% if the regulatory rate of return reverts to historical levels.[26]

In response to a point made in Frontier's original report, PwC says that it was reasonable to assume that the WORM expenditure (if and when it occurred) would be wholly incremental to 'business as usual' levels of replacement and augmentation expenditure.[27]

Finally, PwC suggested that the WORM project represented closer to a 15% real increase in aggregate capital expenditure over the period rather than 20% as reported by Frontier.[28]

25 PwC letter, pp.3-4.

26 PwC letter, p.4

27 PwC letter, p.4

28 PwC letter, p.4

5.2 Frontier response

5.2.1 Path of LRMC

As discussed in our original report and expanded in section 2.2 above, we consider that the bulk of the VTS exhibits significant levels of spare capacity and hence reflects a relatively low average LRMC. Forecasts of peak system demand as well as future GPG have been wound back substantially over the past few years, such that material augmentation to the VTS (other than to meet NSW export demand – which could be addressed by tariff rebalancing) is unlikely to be required for at least a decade according to the criteria in AEMO's 2012 VAPR.

On this basis, we consider it reasonable to suggest that the average LRMC of the VTS is relatively low and likely to start rising gradually towards the end of the next decade. This means that the AER's approach to depreciation is likely to enable average reference tariffs to vary over time in a way that promotes efficient growth in the market for reference services whereas APA GasNet's approach would not.

5.2.2 Path of real reference tariffs

With respect to PwC's point that the AER's depreciation approach will result in rising real tariffs after 2017, we note the following:

- In accordance with our view of the evidence on the VTS LRMC, gradually rising reference tariffs from 2017 would be appropriate.
- Real tariffs would rise only *gradually* under the AER's depreciation approach – the PwC letter itself notes an increase of less than 10% by 2032 even with the regulatory rate of return reverting to historical levels.
- Even if PwC's view is accepted that stable real tariffs would be appropriate, a real increase in reference tariffs of 0.5-0.7% per annum is a fairly stable tariff trajectory *consistent* with the trend in LRMC.
- PwC omitted to mention that under APA GasNet's proposed depreciation approach, real tariffs would appear to fall by approximately 15-20% in real terms from 2013 to 2032 in scenarios 1 and 2, or 0.8-1% per annum *inconsistent* with the trend in LRMC.

5.2.3 Additionality of WORM expenditure

Regarding the WORM expenditure, PwC's reference tariff modelling assumed that the entire project's costs would be incurred in a single access arrangement period (2018-2022) and be wholly incremental to other augmentation and replacement capital expenditure.

In its 5th February letter, PwC justified this assumption as follows:

> Given [that the primary purpose of the WORM is to improve system security rather than to add incremental capacity], it is not unreasonable to assume that it would be incremental to "business as usual" levels of replacement and augmentation expenditure. APA have confirmed to me that it considers the assumption that the WORM project would be incremental to business as usual replacement and augmentation expenditure is a more reasonable assumption than that the WORM would merely displace other augmentation expenditure.[29]

By contrast, we note the following passage from APA GasNet's proposal submission from March 2012:

> The decision to proceed and design of the WORM Project has been largely driven by security of supply concerns, and is therefore relevant to Rule 79(2)(c)(ii). It is important to recognise, however, that ***the WORM Project avoids significant 'stay-in-business' expenditure that would otherwise have been required at a number of sites***. These avoided projects include an upgrade of the Brooklyn Compressor Station, works at Wollert and Iona Compressor Stations, and works to address the Sunbury constraint.[30] [Emphasis added]

In its report to the AER, Sleeman Consulting noted APA GasNet's claimed avoided costs of the WORM and valued these at over $62 million, such that the net cost of the project was only just over $30 million, or approximately one-third of the total cost.[31] This is consistent with our view that the WORM expenditure – if required – would not be wholly incremental to APA GasNet's future capital expenditure.

The above example highlights the need for close regulatory scrutiny of forecast expenditures to ensure that reference tariffs vary over time in a manner that promotes efficient growth in the market for reference services.

5.2.4 Percentage impact of WORM project costs

Finally, on the question of the precise percentage increase in capital expenditure that the WORM would represent, we note that PwC's figure of 15% appears to be based on an increase over augmentation and replacement capital expenditure. Our 20% figure is based on the increase over augmentation expenditure only. This example was purely illustrative and so we see little significance in what approach is adopted.

---

29 PwC letter, p.4.

30 APA GasNet, *Access Arrangement Revision Proposal Submission*, March 2012, pp.100-101.

31 Sleeman Consulting report, pp.37-38.

6 Conclusion – Rule 89(1)(a) criteria

The ultimate question is whether APA GasNet's approach to depreciation satisfies the requirements in Rule 89 (1)(a) of the NGR. Our original report concluded that it did not.

6.1 APA GasNet contention

The Bolding letter concluded that there was no basis in the original Frontier report to conclude that APA GasNet's proposed approach to depreciation would not satisfy Rule 89(1)(a). Further, in circumstances where there is no evidence that the LRMC of supply has substantially changed, this criterion would favour an approach to depreciation that delivers a more stable tariff path, which APA GasNet's proposed approach does.

6.2 Frontier response

For the reasons provided in our original report as well as in this Rejoinder report, we consider that APA GasNet's proposed depreciation approach does not satisfy Rule 89(1)(a), because it would not lead to tariffs varying, over time, in a way that promotes efficient growth in the market for reference services.

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