Australian Gas Infrastructure Group

# Gas distribution network tariffs review

## AGIG submission to AER issues paper June 2023

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# 1. Introduction

This document provides AGIG's response to the AER issues paper, *Review of Gas Distribution Network Tariff Variation Mechanism and Declining Block Tariffs*. We understand from the Issues Paper and the AER's presentation at the June 8 workshop, that there are two main drivers for this review:

1. Emissions reduction policies in various jurisdictions, together with the intended amendment to the National Gas Objective to incorporate consideration of emission reduction targets.
2. Perceived network revenue over-recoveries under a price cap approach and issues with demand forecasting.

In the context of these issues, and in the context of change in the energy sector more broadly, we understand that the AER will review two aspects of its current approach to regulating gas networks; the form of price control and the structure of gas distribution network tariffs.

We appreciate the need to periodically re-examine aspects of the regulatory framework and approach as the energy sector changes. It appears that the AER is concerned about emissions reductions targets and policy, as well as revenue out-performance and proposes that a shift to revenue caps and a different tariff structure may assist in alleviating these concerns. We have responded on this basis but note that stakeholders in this review would be assisted by more clarity from the AER on precisely what the problem is it is seeking to address, and its goals and potential solutions moving forward.

This response is structured as follows:

- Section 2 addresses the two apparent drivers for the review emissions reduction targets and policy and revenue outperformance.
- Section 3 examines the proposed actions (revenue caps and a change away from a declining block tariff) in light of their potential abilities both to address these issues and, perhaps more importantly, the other impacts they may have.
- Section 4 responds to the AER's request for alternate approaches which may provide useful solutions.

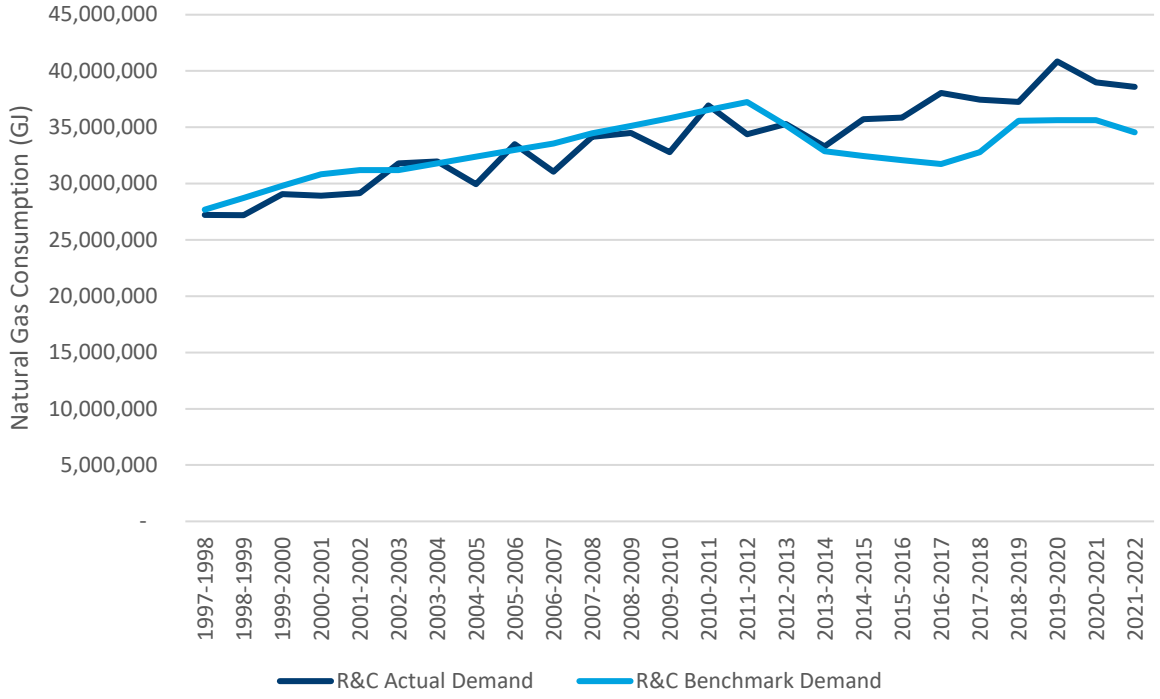
We have not formed a firm view as to the best way forward as yet because, at this stage of the review, the relevant analysis has yet to be completed. Indeed, we believe that no firm views should be formed in the absence of such information and analysis. However, we consider there are adverse consequences of the changes proposed which could be significant and it is unclear whether the proposed changes would in fact alleviate the issues identified by the AER. In these circumstances, we consider a high burden of proof ought to be required before change is made, and that clear, informed customer support should be evidenced.

# 2. The nature of the problem – revenue outperformance and emissions reduction targets

## 2.1. Revenue outperformance

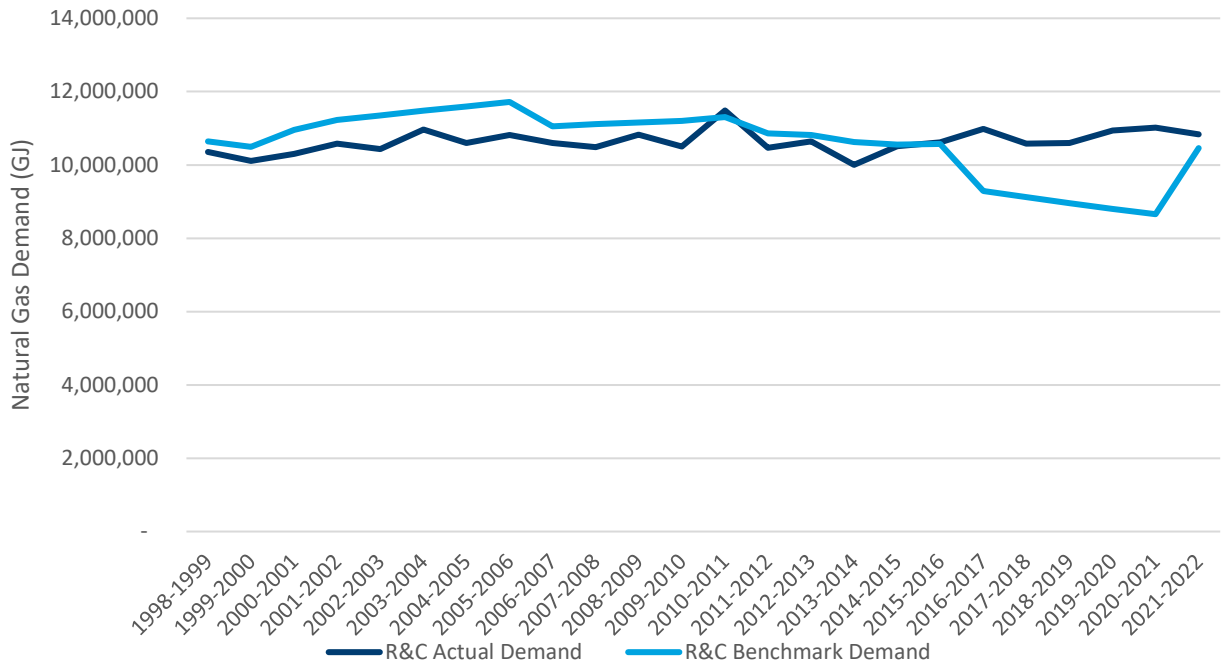
The AER notes (Issues Paper p14) that there has been roughly a decade of outperformance in respect of revenues compared to forecasts.[1] The AER believes that this may be indicative of a systematic effect. However, there are several pieces of key context associated with this out-performance. Firstly, a longer historical record provides a somewhat different perspective in terms of out-performance. This is shown in Figures 2.1 and 2.2 below for Australian Gas Networks for the residential and commercial segment (<10TJ per annum) for the South Australian and Victorian gas distribution networks.

Figure 2.1: AGN Vic Residential and Commercial Actual vs Benchmark Demand




[1] *We disagree with the AER (Issues Paper p15) where it suggests that there have been bill impacts associated with revenue over-recovery. It is incorrect to compare what a bill would have been had it been possible to forecast demand perfectly with the bill which exists and which is based on the best available forecast of demand, and call the difference a "bill impact"; particularly when bills themselves do not change.*

Figure 2.2: AGN SA Residential and Commercial Actual vs Benchmark Demand




The sum of actual gas delivered across the South Australian network is only 0.5% different (ie 255 PJ actual vs 254 PJ forecast and only 2% different across the Victorian Gas Network (ie 844 PJ actual vs 828 PJ). This demonstrates that over time both regulators and industry (who put forward forecasts for approval) have been reasonably well placed to forecast gas demand, including in times of near-term uncertainty.

We also note that the actual gas delivered in recent times is higher than forecast because of strong new connection growth, which in turn has resulted in actual growth capex exceeding allowances set by the AER. Also, the impact of COVID-19 lockdowns which has resulted in net higher tariff V volume ie strong residential consumption offset by reduced commercial consumption.

In respect of the interplay between the form of revenue control and tariff structure, we note that the AER suggests that price caps provide an incentive to out-perform in respect of volumes, and declining block tariffs are used to achieve this out-performance. (Issues Paper p15). However, volume per customer has been falling for several years which we consider does not support the AER's view that we use declining block tariffs to activate the incentives price caps give us to increase volumes from a given connection to drive revenue outperformance.

It is not clear, either, how strong any connection between price caps and connection numbers might be. We are legally obliged to connect where a customer asks for such a connection and it is economic to do so. Customer needs play a key role in connection growth.[2] Moreover, except in some cases of more expensive connections (up-front recovery in this context is limited), we recover none of our own connection cost at the time a customer is connects but instead do so as the relevant assets are depreciated through time. This means that extra revenue generated

[2] *In that context, we note an article on the recent ban of new connections in the ACT, which suggests that even in the market which is arguably most hostile to gas in the country, 80 percent of new homes still sought a gas connection before the ban.*

when connections are greater than forecast is accompanied by higher than expected capex (with its attendant impacts on the CESS) and does not necessarily translate to higher profits. By contrast, if volume demand is lower than forecast, this translates directly into lower profits. Given the future uncertainty and rise of asset stranding risk, it is unclear whether incentives to increase connections flowing from the operation of a price cap are as strong as they may have been in the past.

This is borne out in our forecasts for growth capex. We expect growth capex to decline over the next five-year period, with forecast growth capex across AGIG's gas networks in Victoria of $260m compared to $335m incurred in the current AA period, a 22% reduction.

Added to this, as the AER notes itself (Issues Paper p15) there are many other drivers of demand which are essentially out of our control, such as weather, the overall economy and population growth. There may be other drivers as well. We understand that the AER is undertaking a review of demand drivers for gas as part of its network performance review. We believe it is important that such reviews happen first; before any major changes are made to regulatory approaches, so that an informed view can be made of whether a price cap or revenue cap or some other alternative will be in the long-term interest of consumers.

## 2.2. Emissions reduction targets

The changes to the National Gas Objective (NGO) currently before SA Parliament will require the AER to include emissions reductions targets (Issues Paper pp11-12) as one of the components it considers when undertaking its role. However, it is important to appreciate what this means in practice. The AER correctly note that if the changes to the NGO are adopted, it will be required to balance achievement of emissions reductions along with the other elements of the NGO. It is one of the factors that the AER must have regard to and weigh up in exercising its discretion in various ways under the National Gas Rules. It does not however empower the AER to actively manage or itself cause reductions in emissions from networks.

Indeed, we understand that the principal driver of the change in the energy objectives is to support prudent decisions about emission reducing investments. Had there been a transparent price on emissions put in place, then the cost benefit tests required for expenditure under the Rules could simply have factored in the effect on emissions valued at the market price, and no changes to the regime would have been required. However, absent such a price, the effect that investments may have on emissions would be beyond those accruing to energy customers and so could not be considered when assessing the costs and benefits of such investments. Therefore, a change to the energy objectives is required to ensure that the investments necessary for decarbonization can be assessed correctly under the regulatory framework. It is much less obvious – and not a factor that we understand featured heavily in the debate over the new objective – that implications were intended for matters like the form of control and the structure of tariffs.

Even if the proposed changes to the NGO did provide the AER scope to target emissions reductions associated with the fuel transported by networks, it is far from clear that simply reducing gas usage, and in particular doing so in a uniform way across jurisdictions would be the appropriate response. This is because, with the exception of instances where demand reduction occurs due to efficiency gains, the energy demand served by gas is replaced by another source of energy. The net difference between gas emissions and this next source of energy would need to be considered, not the gross emissions of gas itself. A temporal consideration further complicates the analysis. We understand that all gas networks have blueprints for a transition to renewable gas, and the AER would need to assess this alternative and its likelihood of success as a potential means of reducing emissions when matching emissions considerations with the long run interests

of consumers. Consideration of emissions, if it did go as far as actively managing demand, is very complex.

By way of an example, recent work by Renew suggests significant differences in emissions between jurisdictions in moving from gas to electricity (see Figure 3, here), meaning very different consequences from switching depending upon where it is done, and likely differences in the cost of emissions reduced.[3]

These conclusions are dependent upon assumptions about energy use and differ as the energy mix changes. Meaning that the relevant considerations would be different in different jurisdictions, and at different points in time in the same jurisdiction. This suggests that a one-size-fits-all solution, designed to work over a long period of time, is unlikely to be appropriate and indeed that considering the issue anew at each AA is likely to be more effective.

Finally, we note that some stakeholders have suggested there is an inconsistency between price caps and declining block tariffs on the one hand and jurisdictional policies to move away from gas on the other (Issues Paper, p10), and that the AER suggests (ibid p12) that state government policies are relevant to its review.

To the extent that price caps and declining block tariffs can be shown to increase gas demand, we agree that they would be inconsistent with those jurisdictional policies designed specifically to reduce gas demand itself. However, we would disagree with any interpretation of "relevance" which translates to the AER taking any action outside the particular jurisdiction in question.

Different states legitimately have different policy positions. Governments in Victoria and the ACT, for example, may have expressed a preference for rapid transition away from natural gas. However, New South Wales, Queensland and South Australia have (see Issues Paper p13) rather expressed a preference only for emissions reduction itself, which is not the same thing as a preference to get rid of natural gas, given both the issues of alternative energy sources noted above and the large amount of other ways to reduce emissions in an economy. The more extreme policy positions in Victoria and ACT are not necessarily relevant to the AER's considerations under the NGO in other jurisdictions. Rather than the policy of certain jurisdictions giving the AER general guidance in performing its role, we would suggest that jurisdictional policies are a good reason for the AER not to adopt a one-size-fits-all approach, but rather to act carefully to ensure that it maintains differences between jurisdictions where jurisdictions choose to be different.

*[3] Renew shows Sydney having higher emissions for electricity than gas, with Melbourne having slightly lower emissions. Infrastructure Victoria note that electricity in Victoria is more carbon intensive than gas (see here), and our own internal work (available upon request) also suggests that, due to the dominance of brown coal and the time of day and year gas is used in Victoria, all electric homes may currently be more emissions intensive than if they stayed with gas.*

# 3. Potential adverse impacts from the proposed solutions

## 3.1. Impacts of revenue caps

In a simplistic sense, if revenue over-recovery is a problem, then revenue caps will "solve" this problem as they make over or under-recovery impossible by design. The issue is with the unintended consequences, which may be substantial.

Firstly, as the AER notes (Issues Paper p17), price caps leave volume risk with networks, and revenue caps transfer this risk to consumers.[4] We agree with the AER (Issues Paper p17) that this allocation of risk accords with a basic tenet of regulation which holds that risks should lie with the party best able to manage it. For this reason, we believe that shifting the risk allocation away from the party best able to manage it is something which should be done with great care.

The first step in exercising this care is to clearly understand how great this risk is. We believe it is likely, particularly given increasing change and uncertainty in the energy sector, that the risk is substantial. The second step is to communicate the scale of this risk to customers, so that they can make informed decisions about taking on this risk. We note also that customers in different jurisdictions, may form different views.

Secondly, since demand forecasting is difficult and likely to become more difficult as the energy sector becomes more complex and uncertain, differences between forecast and actual demand are likely to become greater. This means that prices for consumers will fluctuate much more wildly than they would have done in the past had revenue caps existed, and certainly much more wildly than they do in electricity.

If subsequent examination confirms our initial view (See Section 2.1) that the incentive properties of price caps are likely to be relatively weak, and the issues we discuss above are found to be substantial, then it seems highly unlikely that a change to a revenue cap could be seen to be in the long run interests of consumers.

## 3.2. Impacts of changes to tariff structures

We agree with the AER that a flat or an inclining block tariff will reduce demand to some degree compared to a declining block tariff; in other sectors such as water, inclining block tariffs are used specifically to reduce demand and conserve the resource. However as noted above, we do not consider the AER is empowered to itself cause reductions in demand as a means of reducing emissions, or that reducing gas demand will actually reduce emissions overall.

Further, as outlined by PIAC in the stakeholder workshop of June 8; any effects of a change in tariff structure will depend upon retailers actually passing on the change, which is in turn dependent on retailer risks and incentives. Retailer action may blunt any demand impacts that would otherwise arise from a change in network tariff structure.

As with the shift to a revenue cap, we believe that a shift away from declining block tariffs may have some substantial unforeseen consequences. We discuss these briefly below but note that quantifying the impacts would need to be a key part of the AER's analysis going forward.

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*[4] We disagree with the AER (Issues Paper p17) that forecast error is a closely related risk. Forecast error occurs because it is impossible to forecast with perfect accuracy. It is not a risk per se any more than bills being different from what they would have been if perfect forecasting were possible is a genuine bill impact (see Footnote 1).*

Firstly, although the AER (see, for example Issues Paper pp22-3) and others refer to small and large users of gas, this is not the whole story. Our tariff bands are structured such that most of space heating demand occurs in the highest (lowest-priced) band for most customers in cold climates, meaning a key part of the debate is times of high and low usage of gas by a given consumer rather than comparisons between consumers.

Our tariff structure has the practical effect of smoothing bills through the year, making them higher in summer than they would be under a flat or inclining block tariff and lower in winter. Whilst annual bills would not change with a shift to flat tariffs (absent of demand effects), customers would see very high bills in winter and very low bills in summer, particularly in Melbourne. This may impact customers' ability to manage their energy budgets; certainly this is an issue which should be put to them in a manner which supports an informed choice. It is also likely to be the case that jurisdictions will differ in terms of consequence for consumers and their choices.

Secondly dynamic effects are likely to be very different from static effects. When a change is first made, to a flat tariff, say, a smaller consumer will indeed receive a price reduction and a larger customer a price increase (Issues Paper p22). However, if the larger consumer reacts and either drops a high-consuming appliance or electrifies their whole gas load, as network costs are largely fixed, those fixed costs are then apportioned to the smaller user, whose prices rise.

It is by no means certain that, in the longer term, prices will fall for smaller consumers, once these dynamic impacts are taken into consideration. This is an empirical issue; the AER would need to forecast how much it expects demand for natural gas to reduce once a given pricing changes is implemented and use this change in demand to inform future price projections. This then allows it to present the full picture to customers in respect of their costs.

Our view that prices are likely to rise comes from the realisation that what we are doing at present is a form of efficient non-linear pricing (see attached Incenta expert report for technical details). That is, by lowering the price for some types and levels of demand by an amount sufficient to ensure that demand is not zero, we are able to spread our essentially fixed costs over more demand and lower prices that the infra-marginal demand must pay. Removing declining block tariffs removes this ability to obtain efficiency gains for our customers and needs to be balanced against any emission reductions the change in tariff structure may cause.

Finally, the extent to which demand will fall is driven by the elasticity of demand for gas; the closer to zero is the elasticity of demand for gas, the smaller a demand response will eventuate for any given change in price. Work by consultants for the AER suggest that this is somewhat low.[5] If that opinion is borne out by further investigation, then changes in demand from a change in tariff structure are likely to be quite small, and customers will instead see an increase in bills; most particularly if the AER adopts an inclining block tariff to try and use price to push demand downwards. This is likely to have equity concerns, particularly if it exacerbates the situation faced by vulnerable customers or, worse, causes more customers to fall into vulnerability.

## 3.3. Impacts of AER proposed changes on asset stranding risk

Asset stranding risk is not a major focus of the issues paper and is not a reason given by the AER for considering revenue caps and changes to tariff structures. Moreover, as the AER points out, asset stranding risk is created by forces other than the form of price control (Issues Paper p24) and the AER itself has different tools to deal with it such as accelerated depreciation. However, we believe the AER has been too sanguine about the likely impacts of both revenue caps and

[5] *See Partington, G and Satchell, S, 2018, Allowed Rate of Return 2018 Guideline Review, available here, pp 4-7.*

changes in tariff structures on asset stranding risk. This may lead it to inadvertently increase such risks.

Asset stranding risk exists when investors believe it is possible that the price of substitutes for the energy supplied by natural gas will be lower than the regulated building block price of natural gas transport implies for the delivered cost of gas. In such a situation, networks would price to match the competition, rather than lose all or most demand, and such pricing would cause the network to recover less than its remining invested capital. To the extent that the regulated building block price encapsulates 'the regulatory bargain' of allowing recovery of efficient costs, stranded asset risk represents the risk this cannot be achieved.

In this context, we consider that suggesting that a revenue cap lowers asset stranding risk because it increases the likelihood of revenue recovery in the short term (Issues Paper p24) by removing demand or volume risk over the next access arrangement period is incorrect. If we face asset stranding risk because of the possibility that a competing source of energy may have a lower price than our regulated building block price in the 2040s, then this risk is not affected by any change in forms of tariffs between now and say 2030, regardless of how much more these changes might guarantee short-term revenue recovery over the next five years. Action rather needs to be taken to address potential events in the 2040s, which is why we (and the AER) deal with this risk by accelerating depreciation, which has the practical effect of lowering regulated building block prices in the 2040s to avoid the price mismatch.

There are in fact only two ways in which a revenue cap might influence asset stranding risk, both of them negative. Firstly, in the short term, if a particular network was already charging building block prices which were close to the ceiling from a substitute, and a drop in demand caused prices to rise in the following year due to the operation of the revenue cap by an amount sufficient to push prices above the ceiling, then the revenue cap would crystalise the asset stranding risk into losses in the short term. We doubt any networks are this close to their competitive ceiling now, but this is an empirical issue the AER should investigate before implementing revenue caps.

Secondly, if revenue caps become entrenched, and asset stranding risk either emerges or becomes greater, then investors will realise that regulated assets now involve an asymmetry; there is no upside in terms of recovering more than costs the regulator deems efficient, but the weakened effectiveness of the regulatory compact means downside risk of under-recovery has increased. This will impact investment plans for the affected networks who, even if they do not need to grow, will still require maintenance capex to maintain safe operations.

In respect of tariff structure, the AER suggests (Issues Paper p25) that we could offer "prudent discounts" to offset revenue losses from demand reduction from moving to flat tariffs. However, it is not clear how this could operate. Prudent discounts are more applicable to transmission, where a network lowers prices for one particular customer to capture that demand, and if this causes a drop in revenue, recovers this from other customers. It is not designed for distribution and for offering discounts to whole classes of customers. If a prudent discount was offered to whole classes of customers, then it is not clear how this would differ from declining block tariffs currently in place. It also seems illogical if the AER required flat or inclining block tariffs in order to reduce demand (noting our previous comments on the AER's ability to target prices in this way), and then permitted us to undo this requirement by offering prudent discounts to large numbers of customers.

# 4. Some proposals for different forms of control

We do not have any alternative proposals for tariff structures as there is too little information to make an informed argument in this regard at present, although we believe subsequent analysis may suggest that the unforeseen consequences of change will outweigh its intended benefits.

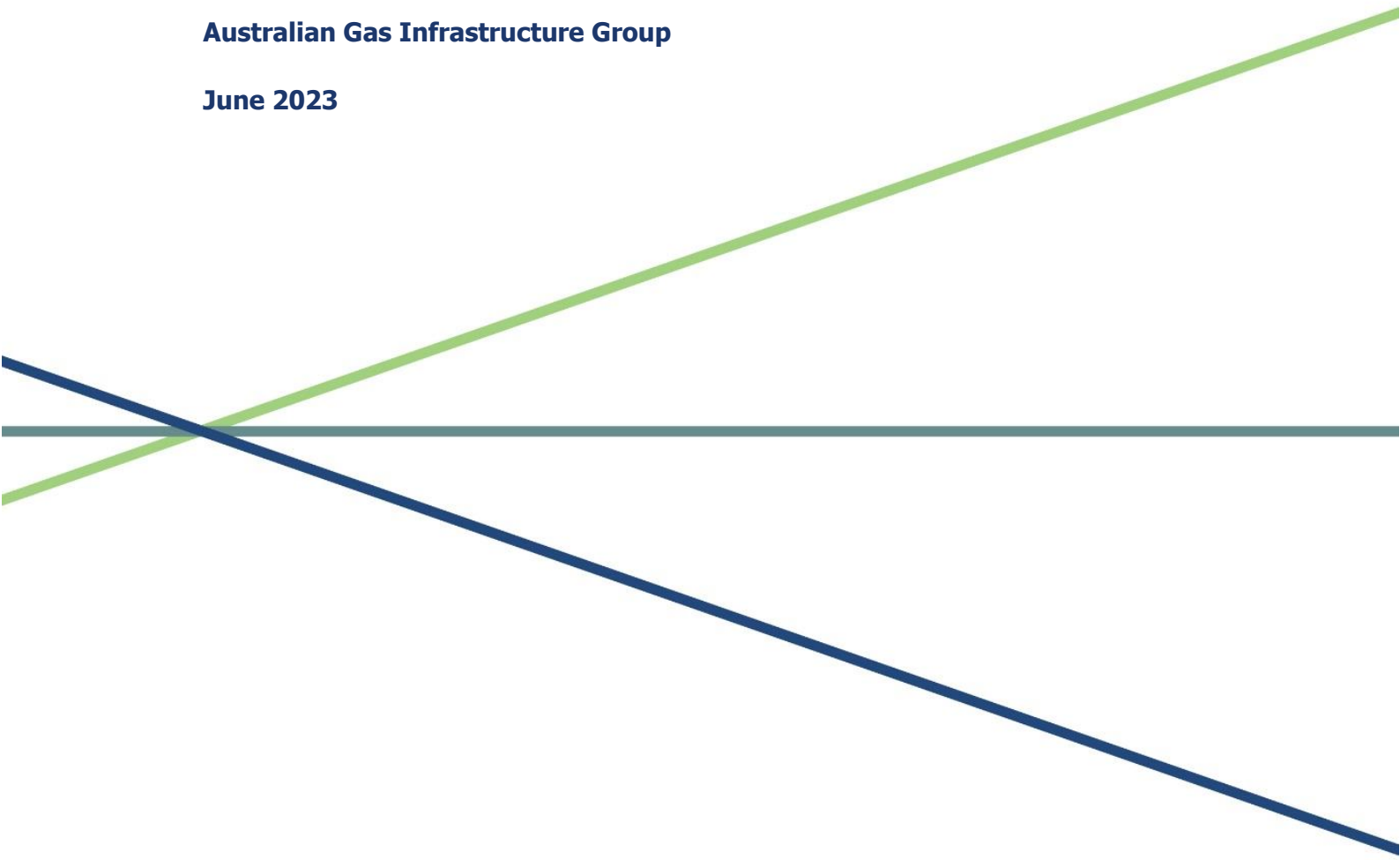
In respect of price and revenue caps, if the concern is revenue over-recovery, then, rather than a revenue cap, it may be appropriate to combine a price and revenue cap via some form of a "cap and collar" approach, or a benefit/cost sharing approach. For example, prices could be fixed (adjusting by CPI as at present), provided demand remains within some band around forecast demand, moving to a revenue cap outside that band. Alternatively, outside the band, revenue over or under-recovery could be shared with customers. Such a mechanism may also serve to blunt any incentives to grow demand, if this is desirable; although, as noted above, such incentives are likely fairly small in any event.

Any such hybrid mechanism must be subject to the same tests we suggest for revenue caps (and changes in tariff structure), and it is by no means certain that it would pass. However, to the extent that more options are needed, this one may warrant further study.

# Price caps and declining block tariffs for gas distribution – a comment

**Australian Gas Infrastructure Group**

**June 2023**



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# 1. Introduction and summary

## 1.1 Purpose

1. The purpose of this note is to provide our comments on:

   a. what were the original justifications for a weighted average price cap and declining block tariff, as is standard for gas distribution, and

   b. whether the new objective for the gas regime – which incorporates references to emissions reduction policies – warrants a change to these aspects of the regulatory regimes for gas distribution, as raised in the AER's recent issues paper on these matters.[1]

## 1.2 Summary of conclusions

### 1.2.1 Rationale for the existing arrangements

2. The weighted average price cap and the declining block price structure were both adopted originally because of their capacity to encourage economic efficiency, and otherwise deliver benefits to customers.

3. Turning first to the price cap, it was adopted because:

   a. this form of control applies a dynamic incentive for distributors to seek more efficient price structures

   b. it provides an incentive for distributors to serve growth (i.e., connections), which has been important given that connection assets are typically recovered through standard prices, and

   c. it provides customers with a degree of price stability and certainty over a regulatory period.

4. Whilst a revenue cap has been applied to electricity distribution, the circumstances there are different, in that:

   a. there is a reduced need to provide incentives to serve connections given that more of this cost tends to be borne by developers, and

   b. the main justification for changing to revenue caps for those businesses that had been subject to a price cap was to remove a potential barrier to introducing tariffs that better signal the cost caused at different times (which creates revenue uncertainty under a price cap), which is not applicable to the gas sector.

[1] AER (2023), Review of gas distribution network reference tariff variation mechanism and declining block tariffs, Issues paper for stakeholder feedback, May.

5. In terms of price structure, the declining block tariff is likely to promote an efficient use of gas distribution networks, in the context where:

   a. the marginal cost of use (short run or long run) tends to be practically zero (losses aside) given that it is typically efficient to construct networks initially to serve all potential demand, implying that the optimal usage charge should also be practically zero (again, losses aside), but

   b. as gas networks compete for customers with electricity, there are efficiency benefits (in terms of broadening the pool of customers) from reducing the fixed charge and raising the variable charge to compensate, but doing so in a manner that recognises that the price responsiveness of demand is likely to increase with the level of demand.

## 1.3 Does the change in objective warrant a change?

6. We do not think that the change in regime objective would justify a change to either of these aspects of the current regulatory arrangements.

7. A change to the form of price control (i.e., to a revenue cap) is unlikely to alter the incentives of the distributors with respect to the promotion of demand. Rather, the increasing risk of asset stranding is likely dominate any other factor. In addition:

   a. a switch to a revenue cap would expose customers to much greater short term price risk, which is likely to be undesirable, and

   b. a revenue cap will be increasingly asymmetric in its outcome as the constraint to pricing from competition increases (which implies an NPV<0 outcome), and so if change occurs now, it may need to be reversed in the future.

8. In terms of the tariff structure, this has the potential to cause substantial customer impacts, whilst having an uncertain (and potentially perverse) impact on emissions. The efficient and fair decarbonisation of residential and commercial gas use requires properly directed and comprehensive measures that ensure the transition that occurs is efficient, happens at the efficient time, and leaves no customer behind.

# 2. Economic basis for price caps and declining block tariffs

## 2.1 Price caps

9. The original economic rationale for a weighted average price cap, also known as a tariff basket, is that this form of control is intended to provide a financial incentive for regulated businesses to rebalance prices towards a form that is more allocatively efficient.

   a. A simple proof of this proposition is included in a book by Laffont and Tirole,[2] where it is demonstrated mathematically that the change in profit generated from a rebalancing of prices is equal to the change in consumer surplus.

   b. This equality means that the circumstances where a firm would choose to rebalance prices (i.e., profit increases) only occurs when this is also beneficial to customers (i.e., consumer surplus increases), and hence a financial incentive exists to improve the efficiency of the price structure.

10. We note that the assumptions underpinning the simple economic proofs of the efficient benefits of price caps are fairly restrictive, for example, with the Laffont and Tirole proof assuming the weights used in the price cap reflect the actual quantities consumed in the year, whereas in practice price caps are typically applied using lagged measures of quantities as weights. However, provided that the relative quantities remain constant, or change in a predictable manner, then the practical forms of weighted average price cap still provide an incentive to improve the efficiency of pricing over time.

11. In addition to this principal incentive reason for price caps, two additional benefits from price caps exist.

   a. First, price caps provide an incentive to be responsive to customers' requests to connect to the network. In the gas sector, the assets required to connect new customers (i.e., service lines and meters) are recovered principally via the gas distribution tariffs, and hence connecting additional customers causes an additional cost to the businesses. The additional revenue delivered via a price cap ensures that distributors have an incentive to meet customers' requests in a timely manner (compared to the alternative of a revenue cap, where the incentive is to defer connections if possible until closer to the next revenue reset).

   b. Secondly, price caps result in a certain trajectory between price reviews (aside from where rebalancing of prices occurs, which is typically subject to specific limitations protections), and so insulates customers from the risk that prices may otherwise change due to unexpected changes in demand. Moreover, whilst sustained changes in demand may flow through to prices in future periods, the option exists for the price impact of any sustained, material change in price to be managed (for example, by setting a profile of prices in the next period that phases in price changes).

[2] Laffont, J and J Tirole (2001), Competition in Telecommunications, MIT Press, pp.66-67.

12. It is noted that the form of control applied for gas distributors differs to electricity distributors, with revenue caps having always applied for some firms in the latter sector, and the remaining firms having since switched to revenue caps. However, there are reasons for this different treatment.

    a. First, most of the cost of connecting new households to the electricity network has traditional been borne by developers or the connecting households – rather than via the electricity distribution charges – and so the incentive issues around connections are less significant than they are for gas distributors. Moreover, unlike the case of gas, there is never a need to seek to connect an existing house to the electricity network given that all houses (aside from those that are remote from networks) are connected upfront.

    b. Secondly, the principal reason for the shift to revenue caps for the remaining electricity distributors was to remove a perceived barrier to those businesses implementing tariff reforms (namely, to better signal the costs caused by using the networks at different points in time, which in turn was enabled via improvements in metering technology). The concern with price caps was that, as the intention was for the tariffs to alter customers' behaviours – but where the degree of response was unknown – then the additional uncertainty caused for revenue under a price cap may create a barrier (and possibly a large barrier) to such reforms being pursued.[3] However, as discussed in the next section, the drivers for tariff reform that exist in the electricity distribution sector do not exist in the gas distribution sector.

## 2.2 Efficient price structures and declining block tariffs

13. Gas distribution networks – in common with many other infrastructure services – are characterised by economies of scale, implying that pricing at marginal cost will not deliver sufficient revenue to recover the cost service provision. Indeed, for gas distribution, this issue is particularly marked, given that the cost of adding to capacity once assets are in place is sufficiently high that it is more efficient to install sufficient capacity for all potential demand initially.[4] This practice means that the marginal cost of using the gas distribution system is limited to the value of gas losses.[5]

14. Given these characteristics of the gas distribution sector, if gas networks were pure monopolies, the efficient tariff would be one that charged for use at the marginal cost (i.e., near zero), and where the vast majority of costs were recovered under a fixed charge. However, the fact that all of the services that can be provided via gas can also be provided via electricity (at least for household and small commercial users, which account for the vast majority of gas distribution revenue) means that attempting to levy

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3 This is a situation where using lagged quantities as weights in a weighted average price cap may not create incentives (and may even disincentives) for tariff improvements.

4 This differs to the transmission level, where the capacity can be enhanced over time by adding compressors and then duplicating segments of pipeline.

5 Moreover, gas losses may be paid for outside of distribution prices. For example, gas losses are paid for directly by retailers in Victoria, although there is an incentive scheme operating around targets for gas losses. If losses are addressed in this manner, then the marginal cost that is relevant to the structure of distribution prices will exclude the cost of losses.

such a high fixed charge would have the potential to dissuade low volume customers (for example, those that intend only to use gas for some of its potential uses).

15. Declining block prices are a mechanism for attempting to attract the small volume gas customers, whilst also not deterring consumption by the large volume customers.[6] Specifically, compared to the efficient price for the pure monopoly case (i.e., near zero variable charge and with the vast majority of cost being recovered under a fixed charge):

    a. a lower fixed charge is applied in return for a higher variable charge, which lowers the overall charge for low volume customers, and so increases the likelihood of attracting these customers, but

    b. by applying a lower the variable charge as the level of usage increases, the effect on consumption by the large volume customers is minimised.

16. Indeed, the outcome of a declining block tariff is very similar to an arrangement whereby customers are offered a menu of choices, with a trade-off permitted between the size of the fixed charge and the variable charge,[7] which are common in other markets (e.g., for various telecommunications services). That is, under a declining block tariff, the low volume customers essentially pay a low fixed charge in return for a higher variable charge, whereas the large volume customers pay a high fixed charge (represented by the amounts paid under the inframarginal tariff blocks) and a low variable charge.

17. In addition, I note that declining block tariffs also have the effect of reducing the variation in revenue to the distributor, as well as the variation in customer bills, both within and between years. This is because gas heating – which tends to be the most variable load within and between years – would typically incur the lowest of the rates that are applicable to a particular customer.

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6 A key driver of the difference in volumes that customers consume is the range of uses to which gas is applied, with low volume customers potentially only having a gas cooktop, and a large volume consumer potentially having all three major appliances run on gas (i.e., cooktop, hot water and heating). As such, the same customer may appear as a low volume customer in summer (when heating demand is low), but high volume in winter (when heating demand is high).

7 I.e., the choices would include high fixed / low variable, or low fixed / high variable, or options in between.

# 3. Comments on the AER proposals

## 3.1 Form of price control

18. The AER's principal reasons for considering whether the form of price control should be changed are that:

    a. the gas distributors appeared to have systematically outperformed under the price cap (although this would appear unrelated to the change in the national gas objective), and

    b. the incentive that distributors have under a price cap to promote the growth of gas may be inappropriate under a price cap.

19. Turning to the first of these matters, I note that the AER's analysis of financial performance is revenue, rather than the change in profit that has occurred, the latter being the more meaningful. This distinction would not be that important if all of the outperformance by the distributors arose as a consequence of an increase in average use per customer, as this typically does not cause any additional cost (as I discussed in the previous chapter).

20. However, where the outperformance arose as a consequence of additional connections, then the additional revenue will occur in tandem with an incremental cost (i.e., the cost of connecting new customers, which is typically recovered via the standard tariffs), and so the effect on profit will be much lower than the change in revenue suggests. Indeed, it is plausible that the additional connections could cause a reduction in profit, especially where those connections occur late in the regulatory period. This arises as a consequence of the incentive scheme for capital expenditure to which the businesses are subject.

    a. Under the existing regulatory arrangements, the additional revenue from unexpected connections is retained only until the end of the regulatory period in which it occurs, after which the connections are included in the demand forecast for the next regulatory period (and customers benefit from having costs recovered over a larger base). Thus, the share of the lifetime customer revenue from unexpected connections that is retained by the distributor gets smaller as the regulatory period progresses.

    b. However, under the capital expenditure incentive arrangements, the share of the lifetime cost of connecting those customers that is borne by the distributor remains constant at 30 per cent. Thus, towards the end of the regulatory period, the distributor would bear a much greater share of the lifetime cost of connecting new customers than the revenue contributed by those customers.

21. Thus, in order to make a firm conclusion about the extent of benefit the distributors may have earned under the price cap arrangements, it is important to examine the source of the outperformance. We would further suggest that caution be exercised in inferring that a material increase in profit is likely to have arisen from serving unexpected connections.

22. In terms of the incentive effects of the different forms of control, in our view the change to the form of control is unlikely to have any meaningful effect on the distributors' actions. The key factor that is influencing all of the distributors' decisions right now is

the looming potential asset stranding event that is associated with competition from electricity and the ceasing of reticulation of natural gas at some stage as Australia decarbonises. Even under a revenue cap – where there may be little benefit in even retaining existing customers and levels of use in the short term – the continued retention of as many customers as possible, as well as connecting new customers provided that they are of sufficiently low cost is the obvious strategy for all to maximise the recovery of sunk costs whilst natural gas reticulation continues, as well as to increase the potential for a subsequent reticulation of hydrogen to be commercially viable.

23. Against this, there are at least two problems that a switch to a revenue cap may cause.

    a. First, as discussed earlier, one of the key benefits of a price cap is that a degree of price stability and certainty is provided to customers between reviews of prices, irrespective of the extent to which demand differs to the forecast. In contrast, under a revenue cap, fluctuations in demand will flow through directly to customers.

    b. Secondly, a revenue cap will become increasingly asymmetric in its operation as competitive constraints (i.e., electricity) become binding on the prices that gas distributors are able to charge. That is, an unexpectedly positive event would cause prices to be reduced, but where competition from alternatives may preclude prices from being increased if the reverse occurs. The result of this is that the expected return during a regulatory period would fall below the WACC implying, in the alternative parlance, that NPV=0 is not achieved.[8] Accordingly, if the form of control is changed to a revenue cap now, a further change would be required as competitive constraints commence binding in a material way.

## 3.2 Price structure

24. As discussed earlier in this note, the existing structure of gas distribution tariffs has substantial merit when assessed from the perspective of economic efficiency, at least prior considering a possible effect on emissions reductions. Indeed, an implication of the earlier discussion is that, although the current tariff structure has a decline in marginal charges as usage increases, even for the largest users there is likely to be a material gap between the price charged and marginal cost.

25. Our view is that distribution tariffs are unlikely to be particularly effective at influencing emissions – and indeed may have perverse effects – but in the process substantial, adverse consumer impacts may occur. First, I note that the effects of a tariff change will depend on the precise nature of that change. In the discussion below, we assume that a higher variable rate is applied for the larger consumers and a lower variable rate for smaller consumers, although some increase in the fixed charge may also occur.

26. The anticipated effects of such in tariff structure are as follows.

[8] A revenue cap for a firm that is facing a competitive constraint is an extreme form of asymmetric truncation of returns (this concept is discussed in: Productivity Commission (2004), Review of the gas access regime – inquiry report, June, pp.404ff).

a. The immediate effect of this change is that one group of customers (those consuming relatively more) will pay more, and another will pay less (those consuming relatively less), than under the status quo.

b. Those customers that pay more may consume less (because they now may a higher marginal rate) and those that pay less may consume more (because they pay a lower marginal rate), although a large response should be expected. This is because demand is fairly unresponsive to price once appliance decisions have been made.[9] We assume, however, that there may be a small reduction in demand overall, reflecting our view that current tariff structures are likely to be optimised.

c. Over time, those customers that pay more may choose to replace appliances with electric ones, and there is a potential for additional gas appliances to be installed by the "pay less" group. The larger the increase in the variable rate for the higher consuming customers, the larger the effect on appliance choice that could be expected. Importantly, however, the incentive and ability to make choices about appliances – including their early replacement – is only likely to exist in practice for owner-occupiers.

d. A consequence of both of the effects above are the demand in future periods would be lower overall, and so prices would be higher. The higher prices may act as an additional incentive for customers to reduce consumption or switch appliances, although again material reductions in consumption are unlikely (except in relation to customers that are in financial distress) and the option to switch appliances is not universal.

e. To the extent that there is a reduction in sustained gas usage, then this is likely to have resulted in an equivalent increase in electricity consumption. The net change in emissions, therefore, will depend on how the emissions intensity of gas usage compares to the emissions intensity of electricity usage. Whilst eventually a transfer to electricity use from consumption of natural gas will necessarily result in a reduction in emissions (i.e., once the electricity supply is fully decarbonised, and with sufficient capacity for existing and new load), whether a switch in load to electricity today – and especially a large load – results in a reduction in emissions is a contested matter (but is not something that we can offer any particular expertise on).

f. A further effect of the reduction in the gas customer base is that the potential for a switch to reticulated hydrogen at some time in the future to be commercially viable is reduced. Whilst the merits of reticulated hydrogen are also contested, I note that all of the gas distributors have active plans on foot for investigating the potential for hydrogen.[10]

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9 Indeed, we should be more worried if there is a large demand response, as this may indicate customers that are in financial stress and so have no option but to go without essentials (i.e., heating during a Melbourne winter).

10 We note that part of the attraction of reticulated hydrogen is that much of the existing gas distribution networks will be able to transport the fuel with little change (i.e., the medium density polyethylene pipe), whereas substantial investment in electricity networks is required for full electrification.

27. A more sensible approach to effecting the energy transition would be via more direct actions, with comprehensive assistance to customers during the process, and at a time when it was appropriate. For example, if the future is to be one of complete electrification, then this should occur once the electricity networks are ready to accept the large increase in energy consumption and where one can have confidence that switch will reduce emissions, and include comprehensive support to customers to change appliances. Similarly, if hydrogen is to be part of the zero-emissions solution, this too will require assistance in the form of upgrading appliances, noting that part of the existing gas load is likely to be electrified under any scenario. Until the point where a conversion is triggered, both the interests and emissions would be furthered by the existing pro-efficiency structure of tariffs.