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Institute for Energy Economics and Financial Analysis

Gas networks are making persistent and significant supernormal profits

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Key Findings

Fully regulated gas networks made $1.8 billion in supernormal profits from 2014 to 2022. This contributed to higher gas bills, and resulted in total profits that were nearly double networks' regulator-approved allowance.

Gas networks are exposed to demand risks and, in aggregate, have benefitted from higher than forecast gas demand since 2014. This is the largest driver of supernormal profits, and is likely related to under-forecasting errors.

There is no strong case for the regulator to transfer stranded-asset risks from networks to consumers via accelerated depreciation or other forms of regulation. Federal and state governments should develop guidance on how to allocate these risks equitably.

Executive Summary

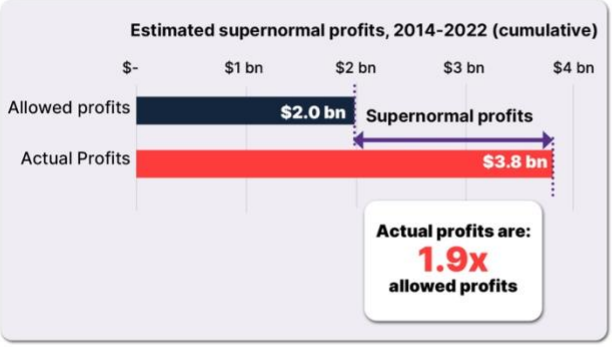
IEEFA has compared the actual profits of Australia's fully regulated gas pipelines against their regulator approved profits (allowed profits) from 2014 to 2022, finding an estimated $1.8 billion in supernormal profits – nearly double their allowed profits.

These profits are persistent, and were found to be significant in every year across the analysed period. They are also excessive, with 75% of profits above the expected reasonable range.

While the incentive-based form of regulation for gas networks permits actual profits to differ from allowed profits, the unusually large scale and persistence of these profits raises doubts about the effectiveness of the regulatory regime in protecting consumers' interests.

Supernormal profits on average contribute to 5% of a typical household gas bill, placing additional pressure on already high energy costs.

Gas networks are consistently making high supernormal profits



Paid for by consumers: On average, gas bills could have been 5% lower since 2014

Consistent: On average, gas networks made nearly double their allowed profits each year since 2014

Higher than expected: 75% of network profits since 2014 are above the expected range

Largest driver: Gas networks' actual demand is consistently higher than their regulator-approved forecasts

Stacks with: Accelerated depreciation charges on gas bills, and other supernormal profit impacts on electricity bills

Gas networks have already been compensated for demand risks. Governments and regulators should not reallocate further stranded asset risks to consumers.

The most significant driver of supernormal profits is "revenue over-recovery". Under their price cap form of regulation, gas networks are able to keep any additional revenue they make if their actual demand exceeds forecast levels. Conversely, they are expected to bear the costs if demand falls below forecast levels. In other words, gas networks are exposed to demand risks.

Unexpectedly, gas networks have persistently benefited from their exposure to demand risks, with actual demand exceeding forecast demand every year since at least 2011. Under the price cap form of regulation, networks have incentives to under-forecast demand, and it is likely that under-forecasting has contributed significantly to supernormal profits.

Persistent under-forecasting is not an intended feature of gas network regulation. If the Australian Energy Regulator (AER) were to correct under-forecasting errors in upcoming forecasts, gas

networks could be exposed to downside risks. There is no regulatory requirement for networks to be compensated for any losses arising from these risks.

These findings raise key questions about how gas pipelines are regulated. While gas demand has consistently exceeded expectations, pipeline operators have been able to keep extra profits. In the long-term, networks and the market operator agree that gas demand is likely to decline due to a combination of consumer financial decisions and government policies. In a non-regulated market, suppliers would be expected to accept not only the upside risks from rising demand, but also the downside risks associated with demand falling faster than expected.

However, gas pipelines have been granted accelerated depreciation allowances by the regulator to shield them from future losses associated with lower demand and stranded-asset risks. This is inequitable from a consumer perspective as there is no strong case for risks to continue to be reallocated to consumers.

Other factors including outperformance in cost of debt and operational expenditure (opex) have also contributed to supernormal profits. The regulatory framework incentivises networks to outperform in these areas, with the expectation that it will lead to long-term efficiency benefits for consumers. However, there does not appear to be clear evidence that consumers have benefited from these profits through productivity improvements.

It is likely that most fully regulated gas networks are generating supernormal profits. The actual return on equity for most pipelines is consistently above the regulator's allowance, in some cases exceeding 20% a year.

Similarly, all fully regulated pipelines have experienced net revenue over-recovery from 2014 to 2022, with Jemena alone extracting more than $490 million above its target revenue levels since 2014.

Financiers should be aware that the persistently high returns experienced by networks since 2014 are not guaranteed to continue, and networks are also exposed to downside risks if demand forecasting errors are corrected.

Additionally, the outlook for domestic gas consumption in Australia continues to shift at a rapid pace. Forecasts broadly agree that domestic gas demand is likely to decline, but an increasing number of developments are creating uncertainty about the rate of decline.

The persistence of supernormal profits related to demand risk exposure has implications for the future allocation of risks between gas networks and consumers. There is no clear basis in the National Gas Laws or National Gas Rules for risks to be reallocated from consumers to networks via accelerated depreciation or changes to the form of regulation. In fact, consumers have already provided significant compensation to networks for their risk exposure in the form of supernormal profits.

As such, IEEFA makes the following recommendations for governments and market bodies:

1	IEEFA recommends that the **Department of Climate Change, Energy, the Environment and Water** (DCCEEW)'s upcoming electricity and energy sector plan includes, as a priority, steps to phase-down gas distribution networks equitably. These could be developed in co-operation with state governments, and must consider the current allocation of demand and stranded-asset risks, including how the benefits and costs have flowed through to pipeline owners and customers over time.
2	IEEFA recommends that the **AER** update its approach to assessing demand forecasts, to explicitly analyse the drivers of differences between actual and forecast demand in previous regulatory periods.
3	IEEFA recommends that for upcoming access arrangements, the **AER:** • Does not approve any further proposals for accelerated depreciation; • Maintains the price cap form of regulation for gas networks; and • Does not approve any decrease to demand forecasts in an existing access arrangement.

How do we measure supernormal profits?

Supernormal profits occur when actual profits exceed the normal returns of a business.[1] In this report, IEEFA has analysed aggregate supernormal profits for Australian gas pipelines that are subject to full regulation by the Australian Energy Regulator (AER).[2] These pipelines are listed in Table 1.

Other gas pipelines operate in Australia that are not under full economic regulation by the AER. These have been excluded from the scope of this analysis.

Table 1: Fully regulated gas pipelines in the scope of this analysis

Victoria	New South Wales	Queensland	South Australia	Northern Territory	Australian Capital Territory
APA Victorian Transmission System **(T)** AGN (Albury & Victoria) **(D)** Ausnet Gas **(D)** Multinet Gas **(D)**	Jemena Gas Network **(D)**	Roma to Brisbane Pipeline **(T)**	AGN (SA) **(D)**	Amadeus Gas Pipeline **(T)**	Evoenergy Gas **(D)**

Note: T = transmission pipelines; D = distribution networks

The AER is responsible for approving the reference tariffs each fully regulated pipeline offers its customers.[3] These tariffs are generally set at a level that allows businesses to recover the estimated efficient cost of providing the service, including an estimated weighted average cost of capital (WACC) to allow for the recovery of a benchmark cost of debt, and reasonable return on equity for a benchmark capital structure (60% debt- and 40% equity-funded).[4]

This return on equity is also known as the Allowed Real Return on Equity (Allowed RoE), and reflects an expected level of profits that a network should return to shareholders, including compensation for systematic risk. However, it is not a constraint. The incentive regulatory framework allows gas networks to differ from the AER's benchmark capital structure, expenditure forecasts or demand forecasts. This means that actual returns (actual Return on Regulated Equity, or actual RoRE) may differ from the allowed RoE.

Networks' actual RoRE is closely related to their net profits after tax (NPAT), and supernormal profits can be determined by looking at the difference between actual NPAT and allowed profits.

[1] For further information see IEEFA. Regulated electricity network prices are higher than necessary. 4 October 2022. Page 4.
[2] The regulatory framework classifies gas pipelines as 'scheme' and 'non-scheme'. Scheme pipelines include pipelines subject to 'full' regulation and 'light' regulation. The AER does not regulate gas pipelines in Western Australia. IEEFA has not analysed non-scheme pipelines, or scheme pipelines subject to light regulation, which operate in a different regulatory context to that discussed here. For more information see AER – State of the Energy Market 2023 – Regulated Gas Pipelines. 5 October 2023. Page 191.
[3] For factors used to determine a pipeline's level of regulation, see AER – Pipeline Regulatory Determinations and Elections Guide. September 2023. Page 23.
[4] AER. Rate of Return Instrument. February 2023. Page 3.

The AER tracks fully regulated gas pipelines' actual RoRE in its annual Gas Network Performance Report, but it does not report their NPAT.[5]

NPAT can be determined if the capital asset base (CAB) and the actual capital structure of the networks is known. This is usually described via a "gearing ratio" – the proportion of the CAB that is funded by debt as opposed to equity (Figure 1). However, this information is also not published by the AER.

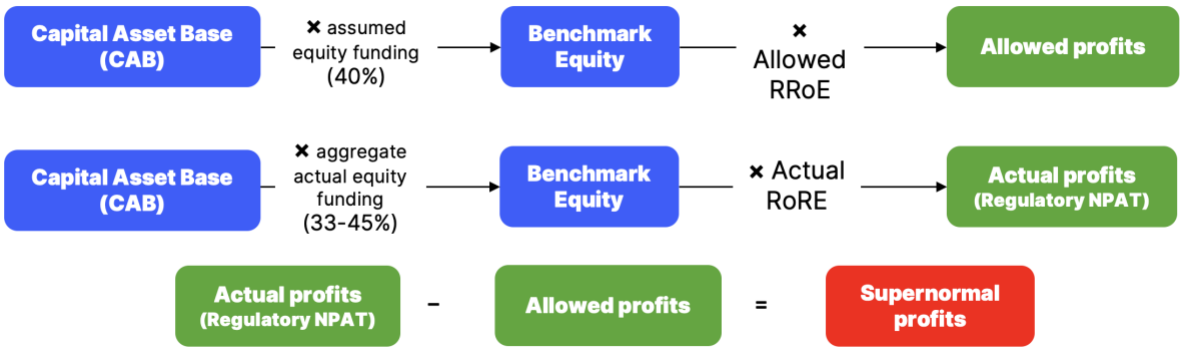
IEEFA has requested the gearing ratios of fully regulated gas pipelines from the AER, and thanks the AER for providing a time series of aggregate gearing ratios for these pipelines from 2014 to 2022.

The AER was unable to provide gearing ratios for individual gas pipelines, which IEEFA understands is due to confidentiality reasons. We note, however, that there would be considerable public benefit in making this data accessible, and we encourage the AER to consider options for publicly reporting this data in future.

IEEFA used the AER's aggregate gearing ratio data to estimate aggregate actual profits (Regulatory NPAT) across the fully regulated gas pipelines based on the method in Figure 1. Actual profits were then compared with allowed profits to determine supernormal profits.

When calculating allowed and actual profits, we have included returns resulting from incentive scheme payments, but excluded returns resulting from indexation of the CAB. This approach aligns with IEEFA's previous studies on electricity network supernormal profits (Box 1).

Figure 1: How IEEFA calculates allowed profits, actual profits and supernormal profits



[5] AER. Gas Network Performance Report 2023. 20 December 2023.

Box 1: Previous IEEFA analysis of supernormal network profits

The methodology in this report is based on previous IEEFA studies of supernormal profits of regulated electricity networks, published in 2022 and 2023.[6]

In a public response issued to IEEFA's 2023 report, the AER verified that it was able to arrive at a similar figure for the difference between actual and allowed network profits as IEEFA, when accounting for individual network gearing data.[7]

However, the AER argued that outperformance of the regulated rate of return was not an indicator of supernormal profits, and did not have a material impact on consumer bills. Rather, it considered it an intended outcome of the incentive-based regulatory framework.

IEEFA welcomes constructive criticism of our approach and findings. However, we have chosen to maintain our current approach to measuring supernormal profits for the following reasons:

- The results published in the AER's response indicate that our approach, although limited by using only aggregated gearing data, provides a reasonable estimate of supernormal profits;
- We consider that there is inadequate evidence to suggest consumers have benefited from the observed history of outperformance, which is due to a range of factors, many of which are not a product of innovation or enhanced productivity;
- We maintain that persistent outperformance of regulated returns on equity is an indicator of supernormal profits;
- We maintain that supernormal profits, particularly at the magnitude observed in IEEFA's reports, have a material impact on consumer bills, and;
- Some drivers of supernormal profits in gas networks differ from drivers in electricity networks due to differences in the form of regulation, and these are worthy of discussion.

More detail on some of these points can be found in IEEFA's reply to the AER's response.[8]

IEEFA considers that supernormal network profits are a material issue worthy of rigorous public debate, and we welcome further responses on the content of our analysis. We would also encourage the AER to provide an independent calculation of supernormal profits as a direct comparison to the findings of this report.

[6] IEEFA. Regulated electricity network prices are higher than necessary. 4 October 2022; IEEFA. No relief from electricity network supernormal profits. 30 March 2023.
[7] AER. AER Statement – Institute for Energy Economics and Financial Analysis report on electricity network profits. 22 November 2023.
[8] IEEFA. Response to AER statement on IEEFA report on electricity network profits. 22 November 2023.

Gas networks have nearly doubled their allowed profits

IEEFA estimates that fully regulated gas pipelines made $1.8 billion in supernormal profits across the full period where performance reporting data is available (2014 to 2022).[9] This is in addition to their $2 billion in allowed profits (Figure 2). Total profits were approximately 1.9 times larger than their allowed profits.

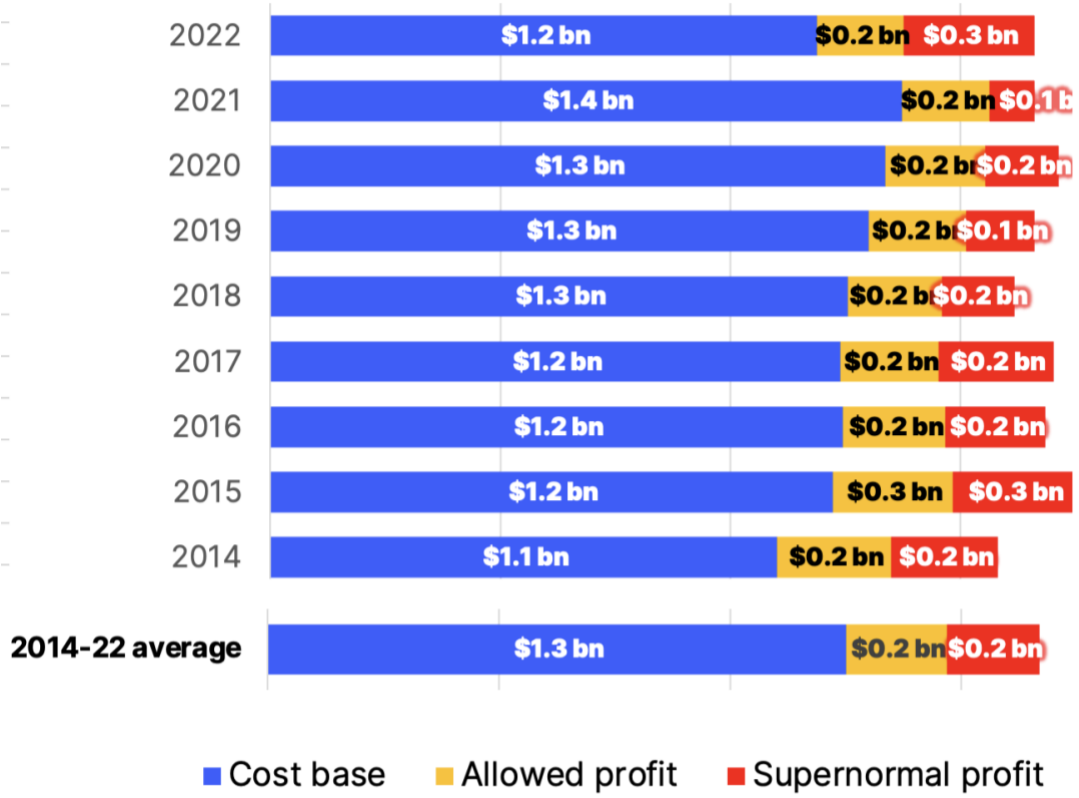
Figure 2: Fully regulated gas pipelines' estimated supernormal profits (2014-22)

Source: IEEFA analysis. Note: Amadeus Gas Pipeline is excluded from cost base due to data unavailability, but is included in estimated profit data.

Unusually large supernormal profits are likely to have persisted across all years in the analysed period. As shown in Figure 3, on average fully regulated gas pipelines made combined supernormal profits of $200 million a year, on top of average allowed profits of $217 million.

[9] Throughout this report, for Victorian networks, years refer to calendar years (2014 is the year ending 31 December 2014). For all other networks, years refer to financial years (2014 is the year ending 30 June 2014). For simplicity and consistency with the AER's reporting, we have chosen not to distinguish between financial and calendar year data when reporting aggregate totals.

Figure 3: Annual estimated supernormal profits (2014-22)



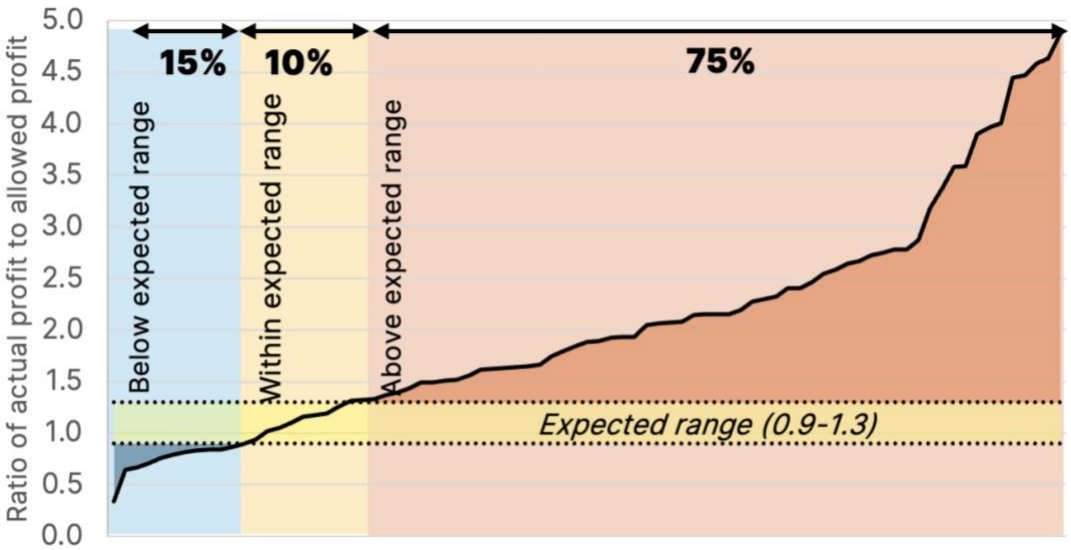
Source: IEEFA analysis. Note: Amadeus Gas Pipeline is excluded from cost base due to data unavailability, but is included in estimated profit data.

Given the regulatory framework does not constrain networks to their allowed profits, some level of supernormal profits (where actual profits exceed allowed profits) is expected. However, a useful approach to assess whether supernormal profits are excessive is to compare the ratio of actual-to-allowed profits against a range of 0.9 to 1.3. This is based on a reasonable ratio of regulated asset base (RAB) to enterprise value for regulated businesses as suggested by Darryl Biggar in 2018, during his time in the regulatory economics unit of the Australian Competition and Consumer Commission (ACCC) and AER. [10]

Figure 4 shows this estimated distribution of profit ratios for each fully regulated gas pipeline from 2014 to 2022, revealing that 75% of profit ratios fall above the upper bound of 1.3. The average profit ratio was 2.0, with the largest profit ratio reaching almost 4.9 times the level the regulator had estimated the network would receive.

[10] Biggar, D. Understanding the Role of RAB Multiples in Regulatory Processes. 20 February 2018.

Figure 4: Gas network profit ratios



Note: Profit ratio distribution is estimated by assuming the AER's aggregated gearing ratio timeseries applies across all networks. The actual distribution may vary depending on individual network gearing ratios.

This shows that in general, gas networks have achieved persistent, unusually high supernormal profits – well above what is reasonably expected from a regulated business.

Notably, this bias is stronger than what IEEFA has previously observed for regulated electricity networks, where 64% of profit multiples fell above the upper bound of the expected range.[11]

Supernormal profits contribute to higher gas bills

The profits made by fully regulated gas pipelines are ultimately recovered from consumers through their gas bills.

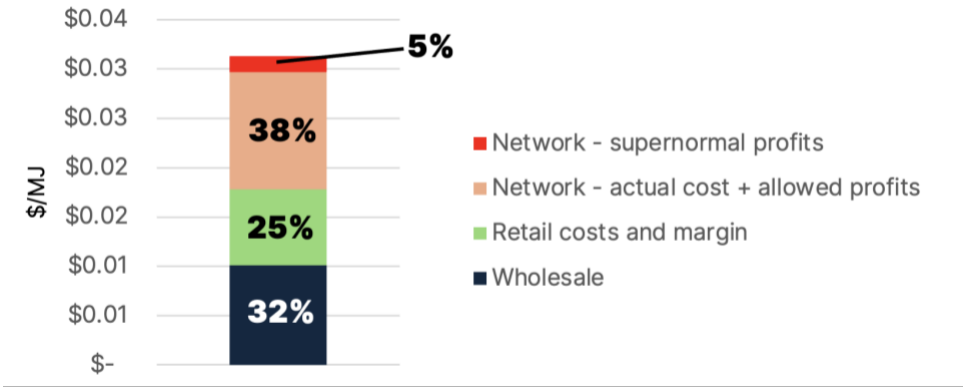
In the case of gas distribution businesses, most of this revenue is recovered from residential customers (on average 80%, but up to 93% in Victoria).[12]

Network costs are usually the largest component of residential gas bills in Australia, on average comprising 40% of the final household bill, although this varies considerably by state and territory.[13]

The revenue estimates in Figure 2 and Figure 3 suggests that about 12% of overall gas network revenue is attributable to supernormal profits. This implies that 5% of a typical residential customer's gas bill is attributable to supernormal profits (Figure 5).

[11] IEEFA. Power prices can be fairer and more affordable. 22 November 2023. Page 30.
[12] Overall average based on IEEFA analysis of revenue from Regulatory Information Notice responses, and Victorian percentage from AER – Gas Network Performance Report 2022. December 2022. Page 107.
[13] AER. State of the Energy Market 2023 – Retail Energy Markets. Page 223.

Figure 5: Breakdown of a typical household gas bill



Note: Based on composition of an average residential gas bill (national) from AER – State of the Energy Market 2023. Assumes 12% of network costs (which are 43% of the total bill) are attributable to supernormal profits.

This is an aggregate estimate only, and the actual impact on an individual gas bill could vary considerably across individual networks.

The impacts of supernormal profits on residential gas bills are significant, as they occur alongside significant increases in the wholesale price of gas, which has risen by an average of 10% a year in the past decade.[14]

As all gas consumers are electricity consumers, they are also exposed to the impacts of electricity network supernormal profits, which on account for 6.8% of the average consumer's electricity bill.[15]

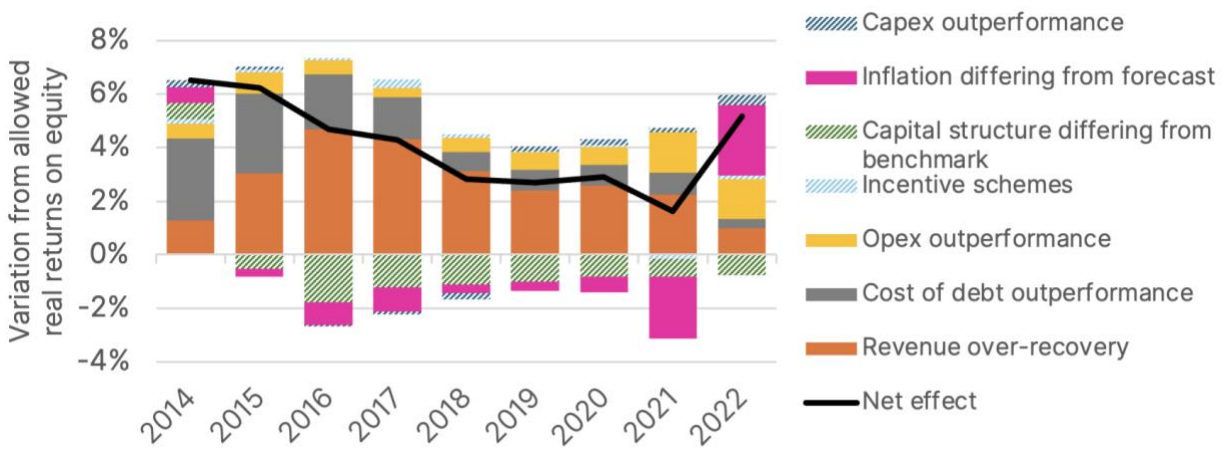
While IEEFA has not analysed the impacts on commercial and industrial customers, we note that the persistence of high supernormal profits indicates that all gas network customers are likely to have been overcharged for their access to the networks.[16]

What is causing supernormal profits?

Several factors cause the actual RoRE of gas networks to differ from their allowed RoE, and contribute to supernormal profits. The AER publishes an analysis of these factors in its annual Gas Network Performance Report.[17] Figure 6 shows a translation of this data from the AER's 2023 report, illustrating the relative magnitude of each driver.

[14] True for Victoria, Adelaide, Sydney and Brisbane. Data from FY2014-24 YTD. Excludes significant price spike in FY2022-23. AER. Gas Market Prices. Accessed 26 April 2024.
[15] IEEFA. Regulated Electricity Network Prices Are Higher Than Necessary. 4 October 2022. Page 36.
[16] Overcharged in comparison to the charges needed to recover the actual cost of operating the network with a reasonable profit margin.
[17] AER. Gas Network Performance Report 2023. 20 December 2023. Page 52.

Figure 6: Contributors to real returns on regulated equity



Source: AER Gas Network Performance Report 2023. Adapted by IEEFA. Some categories are relabelled for clarity.

Table 2 shows the cumulative impact of several significant drivers across the period from 2014-22, accompanied by a brief explanation. These factors are discussed in the following sections.

Table 2: Major drivers of differences between actual RoRE and allowed RoE

Driver	Cumulative net contribution to the difference between allowed RoE and actual RoRE from 2014-22	Explanation
Revenue over-recovery	67%	**Positive contribution** occurs when networks recover more revenue than forecast, usually due to higher-than-forecast demand for gas.
Cost of debt outperformance	35%	**Positive contribution** occurs when networks access lower-cost debt than the AER's benchmark.
Opex outperformance	19%	**Positive contribution** occurs when networks' opex is lower than forecast.
Inflation differing from forecast	-6% *(-16% from 2014-21 then 51% in 2022)*	**Positive contribution** occurs when inflation is higher than forecast. **Negative contribution** occurs when inflation is lower than forecast.
Capital structure differing from benchmark	-20%	**Negative contribution** occurs when networks are geared at a lower ratio (less debt) than the AER's benchmark.

Note: Cumulative net contribution is taken by calculating the contributions from Figure 6: Contributors to real returns on regulated equity

for each driver as a percentage of the net impact (shown by the black line). Not all drivers are listed, and the positive contributions may be greater than 100% as some drivers also led to negative contributions.

Gas networks are exposed to demand risks

Two-thirds of the difference between allowed RoE and actual RoRE from 2014 to 2022 is attributable to what the AER terms revenue over-recovery.

This driver is labelled Other (Revenue) in the AER's Gas Network Performance Report, with the explanation that, "The main driver is that scheme pipelines can earn above or below forecast revenue over time due to changes in demand."[18] In other words, pipelines can earn more revenue than expected if actual demand for gas exceeds their forecasts.

Gas pipeline businesses typically operate with high fixed costs, which includes depreciation on their previous pipeline investments. Most of these costs do not vary depending on the amount of gas the pipeline delivers.

However, to recover these costs, networks charge consumers a rate per connection and a rate per gigajoule (GJ) of gas delivered. To set these tariffs, networks therefore need to forecast how many customers they expect to use their network, and how much gas they expect to deliver.

Final tariffs are approved by the AER under a price cap form of regulation. Here, the AER determines a price path for network reference tariffs at the start of each five-year regulatory period that is expected to cover their costs and allowed profits under a given forecast of demand.

Unlike electricity networks, which are regulated under a revenue cap approach, there are no adjustments made if actual demand falls above or below forecast levels during a regulatory period. Gas networks can achieve revenue over-recovery if they deliver more gas, or connect more customers than forecast.

In other words – gas networks are exposed to demand risks. We consider this to be the most significant driver of gas network supernormal profits.

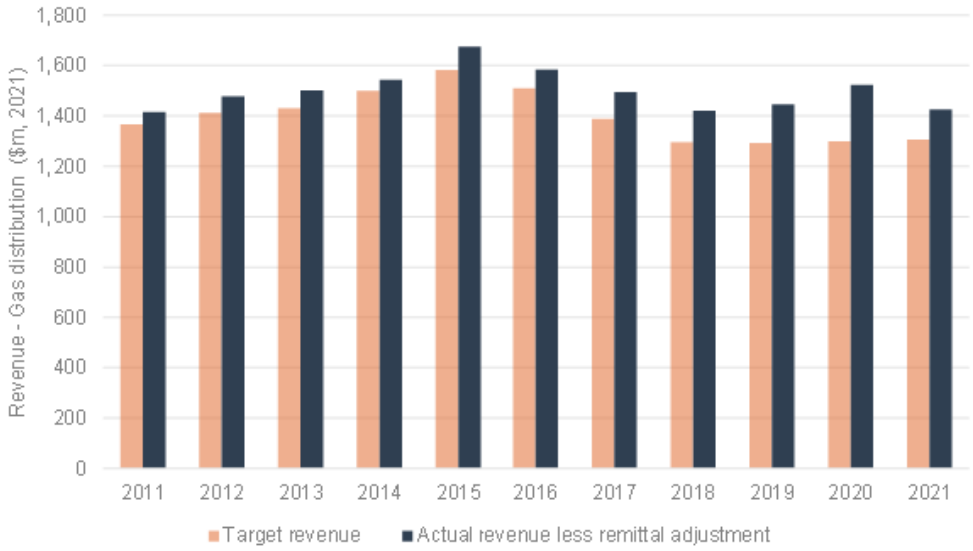
Over the long term, demand forecasting uncertainties ought to result in some years where revenue is higher than forecast, and some years where revenue is lower than forecast. However, this is not the case for gas networks. At an aggregate level, gas networks have consistently exceeded their forecast gas demand.

The AER examined this issue in its 2023 gas distribution network tariffs review, finding that fully regulated gas distribution networks had recovered more revenue than forecast every year from at least 2011 to 2021 (Figure 7).[19]

[18] AER. Gas Network Performance Report. 20 December 2023. Page 52.
[19] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs: Issues paper for stakeholder feedback. May 2023. Page 14.

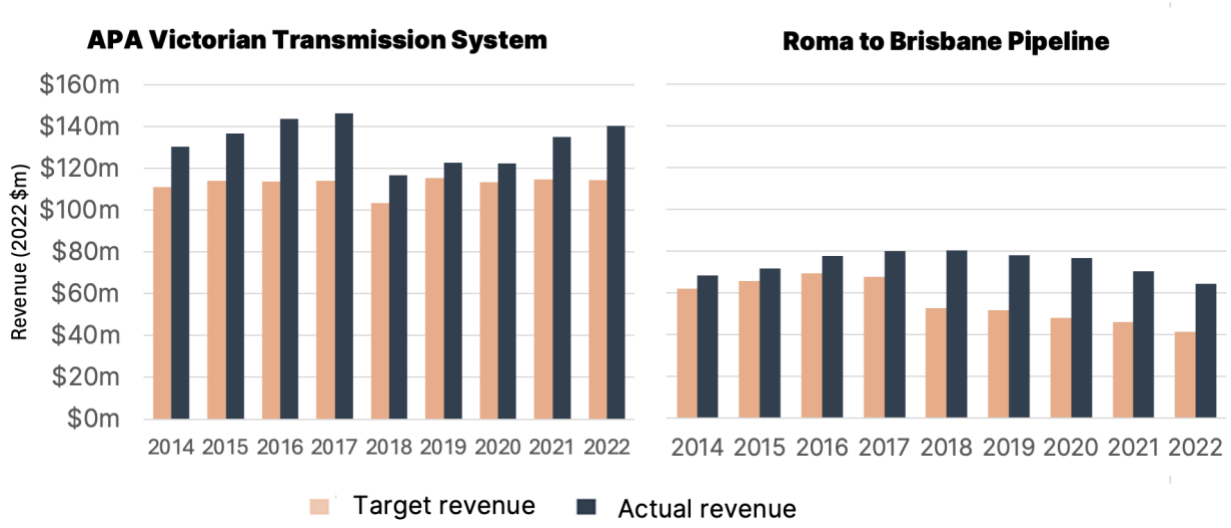
Transmission networks were not in the scope of the AER's review. However, equivalent data for two of the three fully regulated transmission networks displays a similar trend (Figure 8).[20] Note that customers of contract carriage transmission pipelines (including the Roma to Brisbane and Amadeus gas pipelines) are often on negotiated tariffs that may differ from the reference tariffs set by the AER. This presents another opportunity for revenue to exceed forecast levels.

Figure 7: Actual gas distribution network revenue vs forecast (target) revenue



Source: AER

Figure 8: Actual transmission pipeline revenue comparison



Source: AER Note: Revenue data for Amadeus Gas Pipeline is unavailable.

[20] Amadeus Gas Pipeline was excluded, as its revenue is marked as confidential in the AER's Gas Network Performance Report.

Why are gas network revenues consistently higher than forecast?

Three main hypotheses could explain why demand has been consistently higher than forecast across regulated gas networks.

1. Unpredictable factors may have consistently led to higher than expected demand

IEEFA does not consider this hypothesis to be likely, as the persistence of revenue over-recovery over a decade suggests a strong likelihood of a structural cause. We would expect that genuinely unpredictable factors would contribute to both lower and higher than expected demand in the long term.

Energy Networks Australia says, "recent outperformance of gas demand forecasts is relatively well understood and is driven by factors such as colder than average weather and the impact of COVID-19 on consumption patterns."[21]

While COVID-19 is a legitimate example of an unpredictable factor influencing demand, the suggestion that colder than average weather is responsible for higher than expected demand from 2011 to 2021 does not appear to be supported. Cooler weather typically results in higher gas demand for space heating, particularly in Victoria and the ACT. However, those regions experienced higher than normal mean and minimum temperatures across most of those years.[22]

2. Gas networks may be proactively inducing more demand for their services

This hypothesis was discussed in detail in the AER's 2023 issues paper, where the regulator noted that, "One interpretation of [revenue over-recovery] is that distribution network service providers are responding to the incentive properties of price cap regulation and are achieving higher actual volumes than forecasts because of those incentive properties."[23]

Gas networks mostly disagree that they have been able to induce increased demand for their services. Australian Gas Infrastructure Group (AGIG) noted, "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".[24]

It is unclear how much revenue over-recovery may be attributable to these effects. Nonetheless, this incentive appears to be reflected in several common strategies employed by gas distribution networks, including but not limited to:

[21] Energy Networks Australia. Review of gas distribution network reference tariff variation mechanism and declining block tariffs. 16 June 2023. Page 2.
[22] Based on mean temperature anomaly and minimum temperature anomaly compared with a 1991-20 baseline for Victoria, NSW/ACT and Australia overall. Bureau of Meteorology. Australian climate variability & change. Accessed 25 April 2024.
[23] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs: Issues paper for stakeholder feedback. May 2023. Page 15.
[24] AGIG. Gas distribution networks tariffs review: AGIG submission to AER issues paper. June 2023. Page 3.

- The use of "declining block" tariff structures that reward consumers for purchasing higher volumes of gas; [25]
- Offering rebates for new gas connections and installation of new gas appliances (to be prohibited in Victoria from June 2024), [26] and;
- Consumer-facing campaigns that promote theoretical future uses for their network, such as delivering hydrogen or biomethane.[27]

3. Demand forecasts may have been consistently underestimated

The AER has acknowledged that "revenue over recoveries may be due to incorrect initial demand forecasts, or forecasting error. Demand forecasting is inherently uncertain. It may be that we are approving volume forecasts that are too low."[28]

IEEFA considers that under-forecasting error is likely to be a material contributor to gas network supernormal profits.

Price cap regulation does not only incentivise networks to induce greater demand for their services. As observed by Biggar (2018), "Under a price cap form of control, the regulated firm may have an incentive to under-forecast demand."[29]

It is therefore expected that price cap regulation should include mechanisms to correct for this effect. The AER assesses networks' forecasts in accordance with National Gas Rule 74(2), which states forecasts "must be arrived at on a reasonable basis" and "must represent the best forecast or estimate possible in the circumstances".[30]

It is reasonable to expect that a "best forecast" of gas demand would consider any discrepancies between forecast and actual demand in a previous regulatory period, and use this information to improve future forecasts.

Both unders and overs would still be expected in individual years due to genuinely unpredictable factors such as weather. However, no long-term trend should be observed where demand is consistently higher or lower than forecast.

The persistent and (since 2015) increasing difference between target and allowed revenues suggests that inadequate or no correction for under-forecasting is occurring.

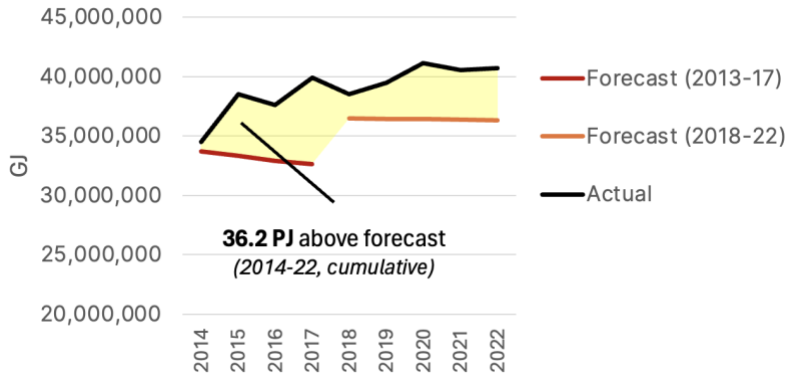
IEEFA has examined recent demand forecast decisions for AGN (Albury & Victoria) as an example.

[25] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs: Issues paper for stakeholder feedback. May 2023. Page 15.
[26] Victoria Government Gazette. No. S 184. 18 April 2024. Page 1.
[27] See IEEFA. 'Renewable gas' campaigns leave Victorian gas distribution networks and consumers at risk. 17 August 2023.
[28] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs: Issues paper for stakeholder feedback. May 2023. Page 15.
[29] Darryl Biggar. Understanding the Role of RAB Multiples in Regulatory Processes. 20 February 2018. Page 6.
[30] AEMC. National Gas Rules. Rule 74.

Figure 9 shows actual versus forecast Tariff V demand from 2014 to 2022 for AGN (Albury and Victoria).[31] It shows that the 2013 to 2017 forecast incorrectly anticipated a reduction in demand (~ -1% p.a.) while actual annual demand grew by 4.9% on average.

For the following 2018 to 2022 regulatory period, forecasts were adjusted upwards based on a new benchmark. However, they still appear to have incorrectly anticipated both the initial demand in 2018 and the rate of change in demand reduction (forecasting an annual reduction of ~ -0.1% while actual demand grew by 1.4% a year on average).

Figure 9: Forecast vs actual gas delivered for AGN Tariff V customers



Sources: Regulatory Information Notice Responses and final Post-Tax Revenue Models for AGN's 2013-17 (Albury / Victoria) and 2018-22 access arrangements.

The AER made no reference to the difference in forecast versus actual demand from previous regulatory periods in its assessment of AGN's 2018-22[32] and 2023-28[33] forecasts.

This suggests that its approach to assessing demand forecasts includes no routine process for assessing, and compensating for, previous forecasting errors.

Is revenue over-recovery expected to continue?

Energy Networks Australia (ENA) has noted that, "it is not a safe assumption that forecasting risk has always been and will always be one-sided".[34]

[31] Tariff V includes residential, commercial and some small industrial customers. This analysis is difficult to repeat for Tariff D (large industrial) customers, which are charged according to their maximum demand rather than gas volumes.
[32] AER. Final Decision: Australian Gas Networks Victoria and Albury gas access arrangement 2018 to 2022. Overview. November 2017. Page 18.
[33] AER. Final Decision: Australian Gas Networks (Victoria & Albury) Gas distribution access arrangement 1 July 2023 to 30 June 2028 – Attachment 12 – Demand. June 2023.
[34] Energy Networks Australia. Review of gas distribution network reference tariff variation mechanism and declining block tariffs. 16 June 2023. Page 2.

While the evidence indicates that the experience of forecasting risk has been one-sided across the period analysed by IEEFA and the AER, it is valid to observe that networks may be exposed to downside risk in future.

The AER has acknowledged that under-forecasting may be a driver of persistent revenue over-recovery. There is a compelling case for the AER to improve its approach to demand forecast assessment to identify and account for forecasting errors in previous access arrangement periods.

Persistent revenue over-recovery is not an intended feature of price cap regulation. If forecasting approaches were adjusted to account for previous under-forecasting errors, networks could be exposed to lower profits or in severe cases, losses in the future.

This could occur, for example, if households were to switch from gas to electric appliances at a faster rate than forecast. There is no clear basis under the National Gas Laws (NGL) or National Gas Rules (NGR) for gas networks to be compensated for losses resulting from these risks.

Other factors have contributed to higher profits

Although revenue over-recovery has been the most significant and persistent contributor to gas network supernormal profits since 2014, and is the primary focus of this report, several other drivers from Figure 6 have also contributed to higher than forecast returns, such as:

Cost of debt outperformance. Although its impacts have reduced over time. Networks can increase their returns by accessing debt at a cost lower than the benchmark level in the AER's Rate of Return Instrument (RORI).

IEEFA's previous analysis on electricity network supernormal profits highlighted that the actual cost of debt accessed by many networks appeared to be consistently lower than that assumed by the RORI, and recommended that the RORI be amended.[35]

Opex outperformance. Its impacts have increased in recent years. Networks can increase their returns if they spend less than their forecast opex allowance.

Incentive regulation is designed to reward networks for opex outperformance, as it is intended that outperformance in one regulatory period would result in a reduced opex allowance in the following period, which benefits consumers in the long term.

However, it is unexpected to observe an increase in the contribution of opex outperformance to higher RoRE over time. This implies that networks are consistently able to find ways to significantly outperform their opex allowance in each regulatory period, which could indicate that opex forecasts are too high.

[35] IEEFA. Power prices can be fairer and more affordable. 22 November 2023. Page 35.

Inflation. While inflation has tended to reduce actual RoRE for most years in the analysed period, it became a significant positive contributor in 2022.

This occurs as the annual tariff variation mechanism for fully regulated gas pipelines includes an adjustment for actual CPI (lagged), whereas the forecast revenue allowance applies a forecast for CPI across the regulatory period. Networks are protected when inflation is higher than forecast, but exposed when it is lower than forecast.

Inflation as applied in 2022 was significantly higher than expected, and there remains considerable uncertainty as to when inflation is expected to stabilise. (For example, inflation in Q1 2024 has declined more slowly than many economists expected.)[36]

It is therefore highly likely that differences between forecast and actual inflation will continue to contribute to supernormal profits in 2023 and potentially 2024, which could offset the negative effect between 2014-21.

C**apital structure differing from benchmark.** The negative impact of this on actual returns implies that gas networks have generally taken on less debt than the AER's 60% benchmark. This is reflected across most years of the aggregate gearing ratio data provided by the AER.

However, while a low gearing may result in lower percentage return to individual shareholders, this does not necessarily reduce networks' absolute supernormal profits at an aggregate level, which are the focus of this report.

Supernormal profits vs productivity improvements

The factors discussed above are understood features of incentive regulation, and the AER has stated that, "The incentive schemes in place under the regulatory framework reward networks for improving productivity and service performance beyond benchmarks."[37]

However, IEEFA's analysis of electricity networks found there was no correlation between electricity supernormal profits and high productivity.[38]

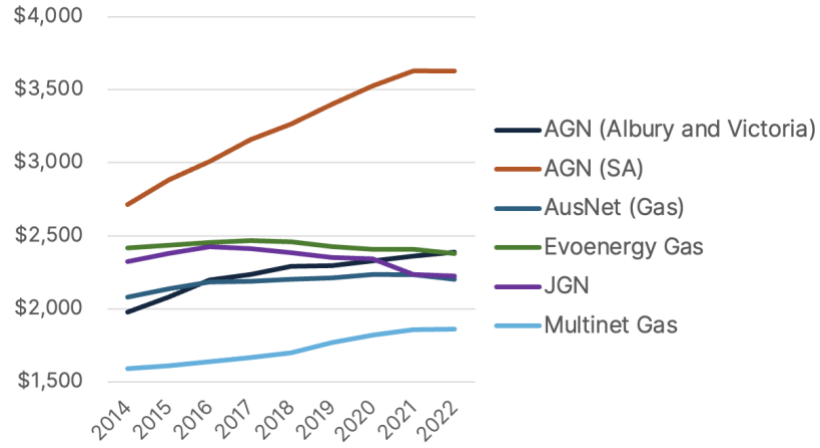
Our analysis for electricity networks referred to the AER's multilateral total factor productivity (MTFP) benchmark.[39] The AER does not report an equivalent productivity metric for gas networks, and there is no equivalent basis on which we can test the attribution of supernormal profits to productivity gains.

[36] The Guardian. Australia's inflation rate slows less than expected to 3.6%, dimming hopes of interest rate relief. 24 April 2024.
[37] AER. AER Statement – Institute for Energy Economics and Financial Analysis report on electricity network profits. 22 November 2023.
[38] IEEFA. Power prices can be fairer and more affordable. 22 November 2023. Page 26.
[39] AER. Annual Benchmarking Report: Electricity distribution network service providers. November 2023. Page iv.

However, IEEFA has presented a simplified metric to estimate gas network productivity for distribution networks – CAB per customer – in Figure 11.

There are only two cases where modest yearly reductions in CAB per customer have been achieved (on average -0.22% for Evoenergy, and -0.54% for Jemena). There is no consistent trend that suggest that persistent supernormal profits are linked to productivity improvements across gas networks generally. In fact, very substantial annual increases in CAB per customer are observed in some cases, including AGN (SA) (on average 3.7%).

Figure 10: CAB per customer for fully regulated gas distribution networks, 2014-2022



Source: AER Gas Network Performance Report 2023 data.

How supernormal profits compare across networks

IEEFA does not have visibility on the absolute NPAT for individual gas networks, which limits our ability to calculate absolute supernormal profits for individual networks. However, the AER does provide actual RoRE data for individual gas networks. This is shown in Figure 11.

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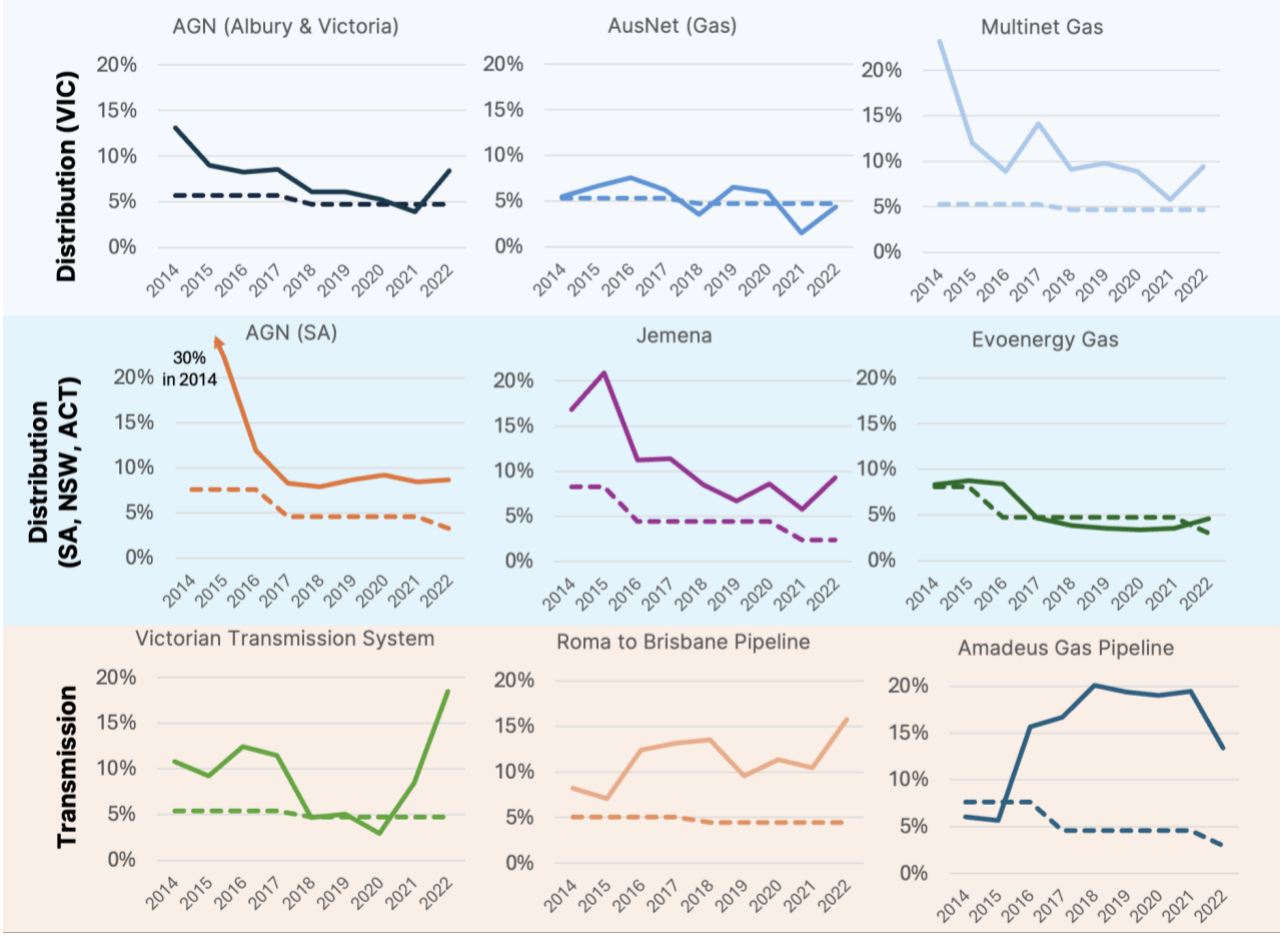
Figure 11: Actual RoRE vs allowed RoE for gas pipelines



Source: AER – Gas Network Performance Report 2023 – Financial Performance Data.

Actual RoRE exceeds allowed RoE in most years across most gas networks, with some exceptions and outliers:

- AusNet (Gas) and Evoenergy Gas generally have RoRE that falls much closer to their allowed RoE;
- AGN (SA), Multinet Gas and Jemena all experienced returns exceeding 20% in 2014 or 2015, including 30% for AGN (SA) in 2014;
- Roma to Brisbane Pipeline has routinely experienced returns over 10% since 2016, and;
- Amadeus Gas Pipeline experienced consistent returns close to 20% from 2018-2021.

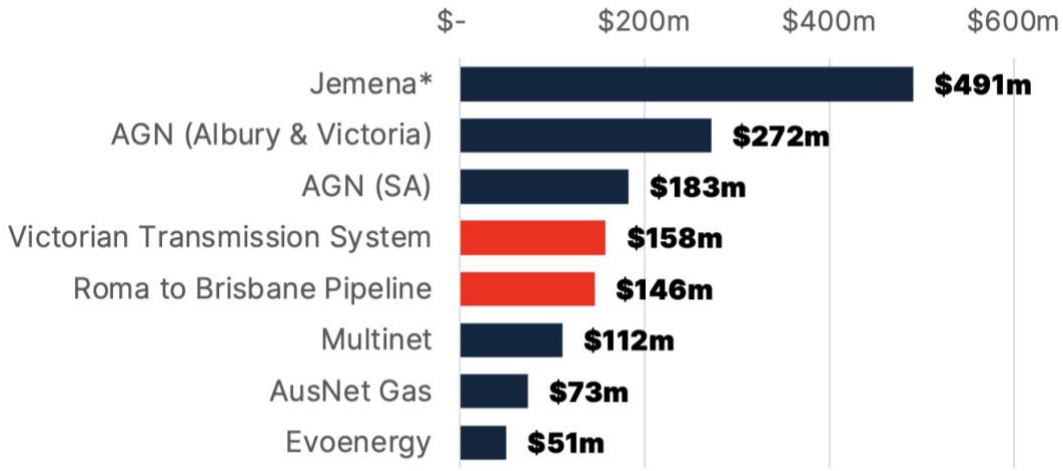
High RoRE may not always translate to high supernormal profits. For example, it is theoretically possible for a network to adhere closely to its allowed absolute profits, yet achieve higher than allowed RoRE by adopting a gearing ratio higher than the AER's 60% benchmark.

However, as the aggregate gearing ratio data provided by the AER is generally close to, or lower than, the 60% benchmark, we consider it likely that many of the high RoRE results in Figure 11 may correspond to high supernormal profits.

The AER also publishes data on the target versus actual revenue for fully regulated gas pipelines, excluding Amadeus Gas Pipeline. As discussed above, this is the most significant factor that has contributed to network supernormal profits.

Figure 12 shows the cumulative amount of revenue over-recovery for each fully regulated pipeline, excluding Amadeus, from 2014 to 2022. All networks experienced net over-recovery across this period, totalling almost $1.5 billion. Jemena alone extracted over $490 million in revenue above its target allowance, even after accounting for the effects of a remittal decision that led to $193 million in revenue over-recovery being deducted from its 2020-25 revenue allowance.[40]

Figure 12: Gas pipelines' cumulative revenue over-recovery (2014-22)



Source: AER Gas Network Performance Report 2023 – Gas distribution and Gas transmission operational performance data. Black = distribution networks; red = transmission pipelines.

**Note: $193m (2020 $169m) has been deducted from Jemena's revenue over-recovery to reflect a remittal adjustment applied to its 2020-25 regulatory period, resulting from a limited merits review decision.*

Implications for gas network financiers

Our analysis found that fully regulated gas pipelines in Australia have been highly profitable for equity holders since 2014, delivering returns that, in cumulative dollar figures, are nearly double the AER's approved allowance.

Gas networks are exposed to demand and forecasting risks under the price cap form of regulation. Fully regulated gas pipelines have consistently benefited from this exposure since 2014, experiencing persistent revenue over-recovery that has translated to unusually high supernormal profits.

[40] AER. Final Decision: Jemena Gas Networks (NSW) Ltd Access Arrangement 2020 to 2025 – Overview. June 2020. Page 6.

However, persistent revenue over-recovery is not an expected feature of price cap regulation. Rather, it is expected that networks are equally exposed to downside demand risks.

There is a compelling case for the AER to increase its scrutiny of networks' demand forecasts, with a particular focus on correcting for previous forecasting errors. The existing form of regulation incentivises networks to under-forecast their demand, and the AER has acknowledged the possibility that it has been approving forecasts that are too low. This may have material implications for forecasts in upcoming access arrangement periods (Jemena's 2025-30 Access Arrangement will be the first following the AER's 2023 review).

The NGL and NGR do not guarantee gas networks any insurance against a reduction in profits, or losses, if the likelihood of downside demand risks increases.

In the event that under-forecasting issues are corrected, fully regulated gas pipelines would be exposed to genuine demand risks linked to the external context of domestic gas consumption.

This context has the potential to shift rapidly. For example, in Victoria's recent gas distribution networks' 2023-28 access arrangement proposals, all networks made substantial reductions to their five-year demand outlook between their draft and final proposals, largely in response to policy developments.[41]

Looking forward, Table 3 lists a series of developments in key jurisdictions that could affect the pace at which domestic gas demand is likely to fall.

Most of these announcements have occurred since 2022, meaning that most impacts are not reflected in gas networks' performance data, and not all factors may be considered in forecasts underpinning gas networks' active access arrangements.

[41] IEEFA. Submission to AER Gas distribution network tariff review 2023. 16 June 2023. Page 3.

Table 3: Recent developments related to the rate of decline in domestic gas demand

Year	Jurisdiction	Development
2021-2024	NSW	Local governments in New South Wales including Inner West, Lane Cove, Waverly, Paramatta, Canada Bay, Canterbury-Bankstown, Ryde, Newcastle, Woollahra and City of Sydney are either implementing or exploring controls to prohibit new developments connecting to the gas network.
2022	NSW	NSW government introduces rebates for heat pump hot water systems under the Energy Savings Scheme.
2023	ACT	The ACT prohibits gas connections in new residential and commercial buildings.
2023	NSW	NSW government updates BASIX building standards, recognising the lower emissions intensity of heat-pump hot water systems.
2023	NSW	Heat-pump hot water system sales quadruple in one year (2022-23), peaking at 25,000 installations per quarter (Q3 2023).
2023	Victoria	Victoria amends its Victorian Energy Upgrades program to remove incentives for installation of new gas appliances, and introduce incentives for household electrification.
2023	Victoria	The Victorian government releases an update to its Gas Substitution Roadmap, signalling: • The intention to conduct a RIS into measures to ensure gas appliances are replaced with electric alternatives at end of life, and; • The intention to conduct a RIS into improvements to rental minimum efficiency standards.
2024	Victoria	Solar Victoria reports record numbers of applications for heat-pump hot water system rebates.
2024	Victoria	Victoria prohibits gas connections in new residential buildings requiring planning permits (with further provisions under consideration).
2024	Victoria	The Victorian government prohibits gas distribution networks offering rebates for the sale of new gas appliances.
2024	East coast gas market	AEMO decreases its long-term central domestic gas demand forecasts for buildings in the 2024 GSOO.

In the longer term, the AER will need to decide how it handles future Access Arrangements if domestic gas demand is forecast to decline rapidly. IEEFA has previously modelled the impact of rapid electrification on Victoria's gas distribution networks, finding that enabling full cost recovery may require inequitable and unacceptable price rises to be passed onto consumers, in addition to the supernormal profits discussed here.[42]

Conversely, we found that Victoria's gas distribution networks could be exposed to about $3.5 billion in unrecovered costs to 2050 in a scenario where the regulator did not pass on the full price rise to consumers. [43]

[42] IEEFA. Managing the transition to all-electric homes. 2 November 2023. Page 21.
[43] Ibid.

Financiers should be mindful that there is no formal guarantee of cost recovery in the National Gas Laws. There are redundancy provisions in the National Gas Rules that allow for the sharing of costs associated with a decline in demand to be shared between the pipeline owners and users.[44] However, such a cost-sharing provision would need to account for the fact that consumers have already compensated networks for their risk exposure to the tune of $1.8 billion since at least 2014.

Implications for governments and regulators

Correcting under-forecasting errors

There is a material likelihood that gas network demand between at least 2014 and 2022 has consistently been under-forecast, which has contributed to significant revenue over-recovery and hence unusually high supernormal profits.

Gas networks are incentivised to under-forecast their demand. A successful price cap form of regulation must therefore involve a mechanism to correct for this effect. As a minimum, this should involve analysing previous differences in actual versus allowed forecasts, and using this as a basis to correct future forecasts.

The AER does not appear to embed such a mechanism in its forecast approval process. In IEEFA's view, this means that final demand forecasts in recent access arrangements cannot be considered "the best forecast or estimate possible in the circumstances" as required by the National Gas Rules.[45]

IEEFA recommends that the AER update its approach to assessing demand forecasts, to explicitly analyse the drivers of differences between actual and forecast demand in previous regulatory periods. This analysis should identify:

(a) Any under-forecasting errors that could have reasonably been accounted for in the previous forecast, and;

(b) Any new trends or structural drivers that ought to be considered in the following forecast.

A mechanism should be developed to directly compensate for any factors identified in (a), and the AER should explicitly identify how factors in both (a) and (b) will be considered in the following forecast.

[44] AEMC. National Gas Rules. 85 – Capital redundancy.
[45] AEMC. National Gas Rules. Rule 74.

Planning for an equitable phase-down of gas

There is a growing awareness that it may not be financially sustainable to maintain gas distribution networks in a future where customers are highly motivated to switch to electric appliances. Such motivation could occur in response to state or federal policies, or equally from independent consumer decisions in response to cost, health or climate concerns.

The AER has acknowledged these issues in its 2021 paper *Regulating gas pipelines under uncertainty*, which observed: "With the prospect of a shrinking customer base and increasing competitiveness of alternative energy sources, regulated gas businesses face a risk that they may not be able to recover the costs of their efficient investments. There is a risk of network assets becoming economically stranded."[46]

The risks have also been acknowledged by gas networks – notably the Dampier Bunbury Pipeline argued to Western Australia's economic regulator that the effective lifetime of the pipeline was likely decades shorter than had previously been assumed.[47]

However, to date there has been no comprehensive policy or regulatory decision on the best approach to address asset-stranding risks for gas consumers and networks.

It is naturally in the interests of gas networks to shield themselves from this risk by transferring it to their customers. This was recently demonstrated by Victoria's gas distribution networks' proposals for accelerated depreciation – which exceeded a combined $460 million (or 9.5% of their 2022 CAB) for the 2023-28 access arrangement period.[48]

While the AER approved a considerable portion of this ($333 million), chair Clare Savage noted that, "Further work is required across the sector to develop a more sustainable solution. In the event that gas demand declines and the number of customers leaving the network increases, there will be upwards pressure on prices for remaining customers."[49]

The AER faces a significant challenge in making these decisions at the point of individual access arrangement periods, as they are tightly implicated with government policy on the future of domestic gas, which is highly divergent among state and federal governments.

The federal DCCEEW has also acknowledged these issues in its recent consultation on a plan to reduce emissions in the energy and electricity sectors, noting, "Regulatory settings will need to be considered as electrification accelerates and use of gas networks declines."[50]

[46] AER. Regulating gas pipelines under uncertainty – Information paper. November 2021. Page 25.
[47] Dampier Bunbury Pipeline. Assessment of the Economic Life of the DBNGP. January 2020. Page 1.
[48] IEEFA. Managing the transition to all-electric homes. 2 November 2023. Page 18.
[49] AER. AER decision supports Victorian gas consumers in energy transition. 2 June 2023.
[50] DCCEEW. Electricity and Energy Sector Plan – Discussion Paper. March 2024. Page 25.

IEEFA recommends that the DCCEEW's upcoming plan includes, as a priority, steps to phase-down gas distribution networks equitably. These could be developed in co-operation with state governments, and must consider the current allocation of demand and stranded-asset risks, including how the benefits and costs have flowed through to pipeline owners and customers over time.

A key consideration of the current allocation of risks is the fact that consumers have already compensated gas networks for their risk exposure by about $1.8 billion from 2014 to 2022.

However, stranded-asset risks for gas networks have arguably been understood from an emissions perspective since at least 1998, when Australia first signed the Kyoto Protocol.[51] It is likely therefore appropriate for the DCCEEW to consider the degree to which gas networks have already been compensated for their risks across a longer timeframe than we have analysed here.

Developing this plan would provide greater certainty to networks and market bodies, allowing for a consistent and fair approach to be applied to each network at the commencement of an access arrangement period.

Interim decisions on stranded-asset risks

In the short term, several gas networks are due to enter new regulatory periods, and the AER will be expected to make material decisions that affect the allocation of stranded-asset risks between networks and consumers.

Three of the key principles that will need to guide the AER's decisions on these matters include:

1. The AER's aim "to ensure consumers pay no more than necessary for safe and reliable energy";[52]
2. The National Gas Objective "to promote efficient investment in, and efficient operation and use of, covered gas services for the long term interests of consumers of covered gas",[53] and;
3. The AER's stated position "that risk should be assigned to the party best able to manage the risk."[54]

In light of these principles:

IEEFA recommends no further proposals for accelerated depreciation be approved.

[51] Parliament of Australia. Paris climate agreement: a quick guide. 10 November 2017.
[52] AER. AER Strategic Plan 2020-2025. 2020. Page 16.
[53] AEMC. National Energy Objectives. Accessed 26 April 2024.
[54] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs – Issues paper. May 2023. Page 17.

Accelerated depreciation involves reallocating future network depreciation costs to consumers. It accelerates the reduction in networks' CAB by increasing the near-term charges to consumers.

However, our analysis has shown that fully regulated gas pipelines have already extracted an additional $1.8 billion in revenue above the AER's profit allowance This has been enabled by networks' exposure to demand risks, and appears to conflict with principle 1 above.

In other words, consumers have already compensated networks substantially for their risk exposure, and there does not appear to be a strong basis for even more of these risks to be passed on to near-term consumers via accelerated depreciation. This would appear to conflict with principles 2 and 3 above.

At a minimum, an appropriate response to any accelerated depreciation proposals would be to deduct any excessive supernormal profits from this allowance, in accordance with the level of compensation networks have already received for their risk exposure.

As mentioned above, it may be appropriate to consider supernormal profits across a timeframe beginning much earlier than 2014. In practice, it could be that no level of accelerated depreciation is appropriate for certain networks in the short term.

IEEFA recommends the price cap form of regulation be maintained for gas networks.

Several gas networks have indicated they may request to move to a revenue cap or hybrid price-revenue cap form of regulation in future access arrangement proposals. This is expected, as it would allow networks to shield themselves from some portion of their demand risks by reallocating them to consumers.

Under a revenue cap approach, any over- or under-recovery of revenue during a regulatory period would be adjusted for via tariffs. Consumers would benefit if demand were higher than forecast, but they would be expected to compensate networks if demand were lower than forecast.

A hybrid price-revenue cap approach would allow networks to bear the risk (and potential benefits) from differences between actual and forecast demand within a set range. However, if under- or over-recovery exceeds a set range, this would again affect consumer tariffs.

Either change at this time is problematic for consumers, as networks have been the sole beneficiaries of demand risk exposure since at least 2014. It is reasonable to expect that networks should also face any downside risks from this exposure (for example, if under-forecasting errors were corrected, and if gas demand reduces faster than expected). A change to the form of regulation would appear to conflict with principles 2 and 3 above.

To justify why a revenue cap or hybrid price-revenue cap approach is appropriate, the onus must be on networks to explain why the existing allocation of asset-stranding risks is inequitable from their

perspective. In IEEFA's view, there is no clear evidence to support this, and no clear basis in the NGL or NGR for reallocating further risks to consumers.

IEEFA recommends demand forecasts not be decreased during an access arrangement.

Finally, we note that Rule 65 of the National Gas Rules allows gas networks to submit an application to vary an approved access arrangement, which could be triggered if volumes were significantly lower than forecast.[55]

The AER has already observed that, "Customers do not have the same opportunity to reopen an approved access arrangement if actual volumes are higher than forecast."[56]

The use of Rule 65 to compensate networks for downside volume risks would therefore appear to be inequitable, and conflict with principle 3 above.

Conclusion

The analysis here has found that Australia's fully regulated gas pipelines have extracted persistent and unusually high supernormal profits from 2014 to 2022 to a total of $1.8 billion. These are likely to have been shared across the majority of networks, which have produced exceptionally high returns for shareholders, well above the allowance set by the AER.

This has material implications for consumers, whose gas bills on average could have been 5% lower if these supernormal profits had not occurred. It has presented an unnecessary burden alongside rising wholesale gas prices, electricity network supernormal profits, and more recently, accelerated depreciation charges.

Gas networks are exposed to demand risks, and some supernormal profits are expected as a result. However, the actual supernormal profits are far more persistent than would normally be expected under a price cap form of regulation, and gas networks have consistently recovered more revenue than forecast since at least 2011. There is a strong likelihood that demand has been under-forecast across this period.

While gas networks have consistently benefited from their demand risk exposure to date, financiers should be aware that they are equally exposed to downside risks in the event that forecasting errors are corrected.

[55] AEMC. National Gas Rules. Rule 65.
[56] AER. Review of gas distribution network reference tariff variation mechanism and declining block tariffs – Final decision. 31 October 2023. Page 7.

This is compounded by the fact that the outlook for domestic gas consumption in Australia is shifting rapidly. There is a growing consensus that residential gas use is likely to decline, but several factors make it difficult to predict how quickly this decline will occur.

If gas demand falls faster than forecast, networks would be exposed to lower profits or losses, and the regulations do not require that they be compensated for losses resulting from demand risks.

As networks themselves are incentivised to under-forecast demand, it is critical that the AER begin accounting for previous under-forecasting errors when approving ongoing forecasts.

However, longer-term thinking is also needed, and the federal government, in co-operation with states, is well placed to develop an overarching plan to phase-down gas networks equitably. This plan could provide guidance on how stranded-asset risks should be equitably shared between networks and consumers.

While this guidance is being developed, there is no clear basis for the AER to approve further reallocation of stranding risks from networks to consumers, via accelerated depreciation or a change to the form of regulation. Our analysis has shown that consumers have already compensated networks $1.8 billion for their risk exposure since 2014 alone. This must be given consideration before any decisions on the future allocation of risks are made.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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