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October 2022

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IEEFA.org

Regulated Electricity Network Prices Are Higher than Necessary

An Assessment of the Economic Regulation of Australia's Electricity Networks

Executive Summary

Consumers are paying much more than necessary for safe and reliable electricity.

Data released by the Australian Energy Regulator (AER) in July 2022[1] shows that the actual returns[2] received by electricity networks from 2014 to 2021 are consistently higher than the normal level of return. The total extra profit above normal levels, or "supernormal profit", extracted by network businesses over the eight-year period was $10 billion. The actual profit received was 67% higher than the normal level of profit.

Total extra profit above normal levels, or "supernormal profit", extracted by network businesses over 2014-2021 was $10 billion.

Distribution and transmission network service providers in the National Electricity Market (NEM) are natural monopolies because it is not efficient to build multiple electricity networks alongside one another. To ensure that the networks do not exert monopoly pricing power, the AER regulates the prices networks charge consumers. The AER is responsible for making sure that networks charge consumers only what is required to cover the costs of investing in, building, maintaining and operating the networks, plus a reasonable profit to ensure compensation for investors.

In its Strategic Plan 2020-2025, the AER states its key objective regarding network regulation is to ensure that "consumers pay no more than necessary for the safe delivery of reliable electricity and gas network services".[3] The National Electricity Law's revenue and pricing principles state that returns to shareholders should be "commensurate with the regulatory and commercial risks involved in providing" regulated network services.[4]

** Note: This report was finalised before the Australian Energy Regulator's State of the energy market 2022 report was released.*

[1] Australian Energy Regulator (AER). Electricity network performance report 2022: Financial performance data 2022- Electricity networks. 15 July 2022.

[2] Real return on equity data was released by the AER. "Returns" is used here for simplicity.

[3] AER. AER Strategic Plan 2020-2025. 2020. Page 19.

[4] See Appendix B for further details.

Under incentive regulation, regulated networks have the opportunity to earn supernormal profits by exceeding expected efficiency improvements. However, productivity and performance improvements do not explain sector-wide supernormal profits over eight years, spanning almost two five-yearly price control periods. The reason for the supernormal profit was that the AER and the network businesses overestimated the costs that network businesses would require to build, operate and maintain the network. Networks charged those overestimated costs to consumers, and shareholders retained the differences between revenues and costs.

In IEEFA's view, the observed persistent sector-wide supernormal profits do not appear consistent with the revenue and pricing principles set out in the National Electricity Law, the National Electricity Objective, or the AER's objective of ensuring that consumers pay no more than necessary for network services.

The supernormal profits issue needs to be examined and rectified. IEEFA has presented a range of recommendations in this report. If this situation is not improved, energy consumers will continue to pay more than required for electricity distribution and transmission network services.

NEM Networks Are Economically Regulated to Control Price to Consumers

Electricity networks are expensive businesses to run. In Australia, the economic regulation of electricity networks is undertaken by the AER. The AER regulates the amount networks can charge to consumers, under rules set by the Australian Energy Market Commission (AEMC).

The networks submit their expected future costs to the AER for its review. The AER makes revenue determinations allowing networks to recover future estimated efficient costs from consumers plus a return on capital invested (to ensure that investors in the networks are reasonably compensated). The total cost that networks can recover from consumers is the "regulated revenue". The AER sets a regulated revenue for networks every five years, representing the total estimated amount that networks can charge consumers on their electricity bills for regulated network services.

The costs that the networks face, which determine the regulated revenue they can receive from consumers in the form of electricity network prices, include the following "building blocks":

- repaying the capital cost associated with building the network (depreciation)
- providing a return on capital to investors who have invested in the network assets (including both debt and equity investors)[5]

[5] Debt and equity financing cost estimates seek to adjust for the opportunity cost of investment.

- the operating expenditure (opex) required to run the network—including maintenance, staffing and other operational costs
- tax costs
- other network business costs.

Estimates of future building block costs are adjusted for the cost of continued upgrades to and building of networks, subject to regulatory investment tests and AER review of regulated capital expenditure (capex) proposals.

Networks are also rewarded or penalised for productivity and quality performance through explicit "incentive schemes". The cost or reward related to networks participating in incentive schemes is also added to, or subtracted from, the total allowed revenue for the given network business.

Equity shareholders in network businesses require adequate returns to incentivise them to invest. The AER determines a reasonable real return on equity for each network business (the "allowed" RROE), considering equity investor risk appetite and opportunity cost. This "allowed" RROE is included in the cost build-up for each network's regulated revenue—that is, consumers pay for returns to equity shareholders through their electricity bills.

Networks Are Charging Consumers Too Much

As noted above, data released by the AER in July 2022[6] shows that the actual return to equity shareholders has significantly exceeded the allowed return level forecast by the AER over an extended period. Most network businesses are charging consumers significantly more than required to achieve their normal return and pocketing the difference in the form of additional returns.

The AER has released data on the percentage returns for electricity networks, but so far has not disclosed what the percentage return figures mean in dollar terms (i.e., the network business profits) or the bill impact on consumers.

To determine the profit the networks have made, IEEFA has converted AER inflation-adjusted RROE percentages data[7] to dollar amounts using non-indexed regulated asset base data published by the AER. Applying a debt-to-equity ratio assumption of 60:40 (the only assumption in this analysis),[8] supernormal profits can be determined from the difference between total costs (including normal profit) and total revenues.

If regulation were effective, then for the average network in the average year, costs and revenues should be more or less equal. However, IEEFA's results demonstrate that actual regulated network revenue exceeded total regulated network costs by

[6] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[7] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[8] This is to avoid double counting the contribution of higher gearing (debt) to supernormal profits.

10.8% during 2014-2021.[9] This gap between cost and revenue is a supernormal profit extracted by networks—a charge for costs that do not exist.[10]

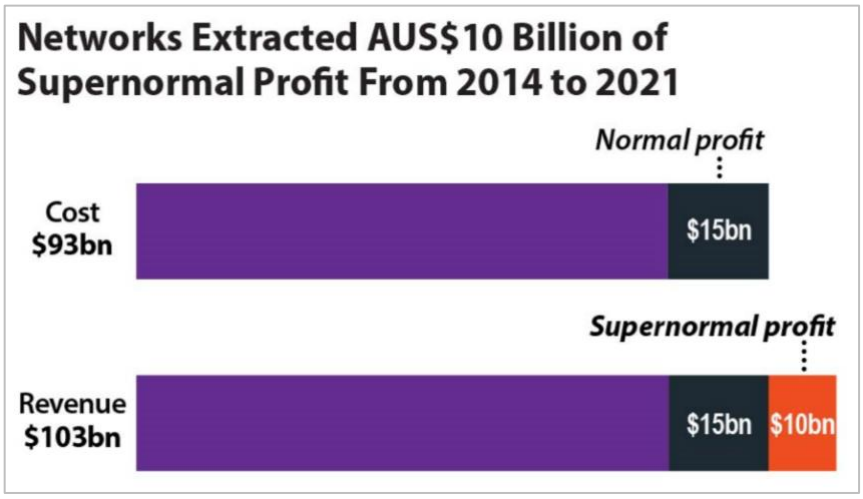
In dollar figures, the supernormal profit over 2014-2021 was nearly $10 billion, or more than $1.2 billion annually.[11] Of the 18 NSPs, 14 extracted supernormal profits above IEEFA's expected profit multiple range.

Difference Between Electricity Network Revenue and Cost, 2014-2021

	$m (real)
Total actual regulated network revenue	$102,745.5
Total actual regulated network cost, including capital expenditure and risk-adjusted return on capital (normal profit)	$92,761.2
Total supernormal profit (total revenue minus total cost)	$9,984.3
Total regulated network revenue as a percentage of total actual network cost	110.8%

Source: AER data,[12] IEEFA analysis.

Network Costs, Profits and Supernormal Profits, 2014-2021



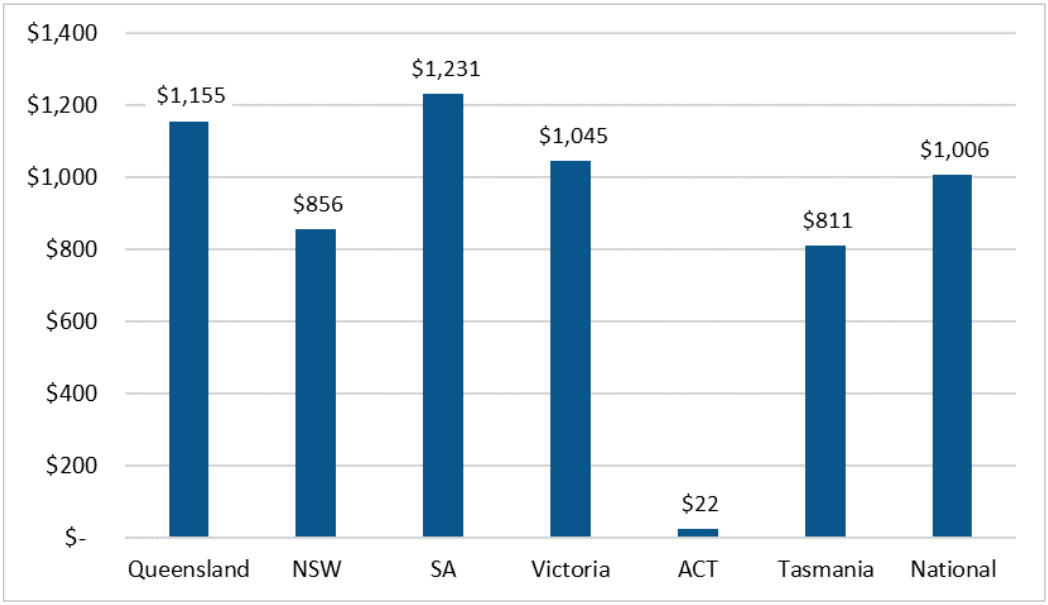
Sources: AER data, IEEFA analysis.

[9] This is inclusive of risk-adjusted returns on capital and all regulated capital expenditure.
[10] Supernormal profit (loss) is defined as revenue minus (plus) total cost. Total cost includes returns sufficient to compensate debt and equity financiers for the risk adjusted opportunity cost of their investment. Economic profit is interchangeable with supernormal profit/loss. If a firm makes more than normal profit it is called supernormal profit. Supernormal profit is all the excess profit a firm makes above the minimum return necessary to keep a firm in business. Supernormal profit is also called economic profit, and abnormal profit, and is earned when total revenue is greater than the total costs.
[11] Note that the RROE data for 2021 are not available for four Victorian networks—CitiPower, Jemena Electricity, Powercor Australia and United Energy—and are likely to understate supernormal profits for that year.
[12] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The data shows that economic regulation of electricity networks in most of Australia over the period 2014-2021 has consistently failed to prevent networks from setting prices well above their total costs.

The supernormal profits built up over eight years imposed an additional cost of between $800 to $1200 per customer, depending on the state.[13] Of all NEM jurisdictions, only the Australian Capital Territory (ACT) has managed to constrain revenue close to costs.[14]

Cumulative Supernormal Profits per Customer by Jurisdiction, 2014-2021



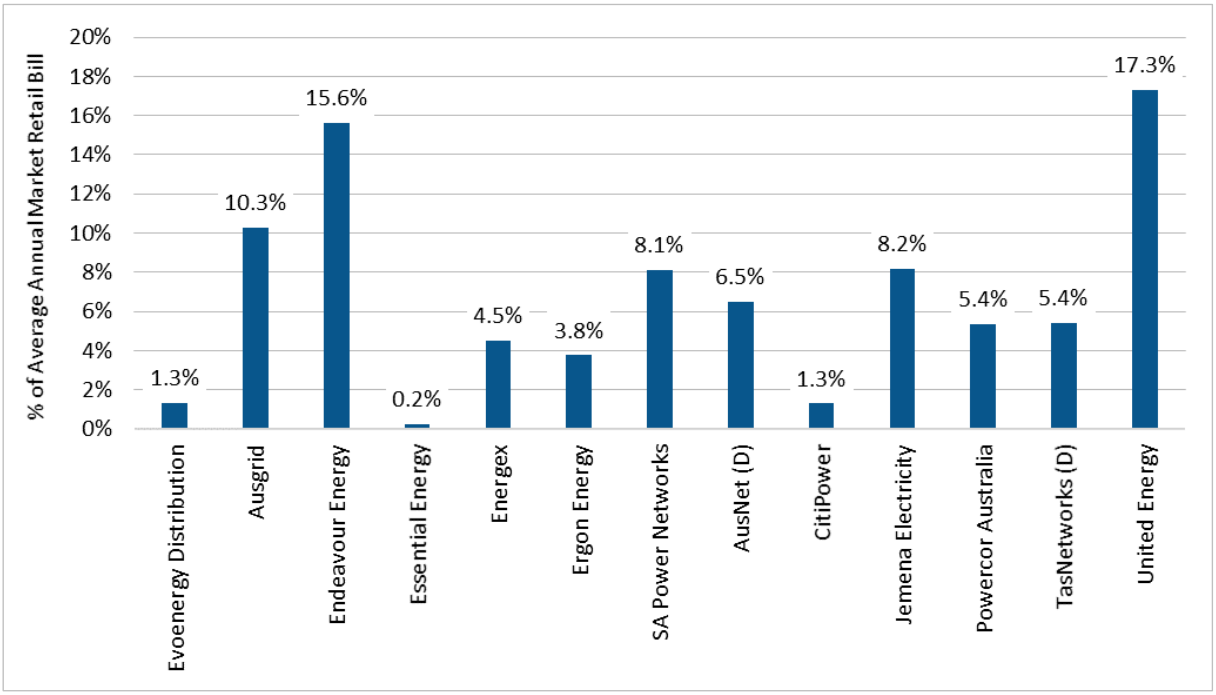
Source: AER data,[15] IEEFA analysis.
Note: Western Australia is not part of the National Electricity Market and is excluded from this analysis. AER data for the Northern Territory is not available for the entire period.

The following figure illustrates the extent to which retail bills have been inflated by total supernormal network profits, for each distribution network area, in percentage terms in 2020.

On average, across all networks, 6.8% was added to customers' retail bills by network supernormal profits. The range was wide: from 0.2% for Essential Energy in New South Wales to 17.3% for United Energy in Victoria.

[13] Note the ACT is excluded from this range due to very low supernormal profits such that it is negligible.
[14] This outcome may reflect Evoenergy ownership arrangements or ACT government decisions to cap profit to no more than the cost of equity.
[15] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

Estimated Retail Bill Impact of Network Supernormal Profits, 2020, by Distribution Network (relative to average market retail bill)

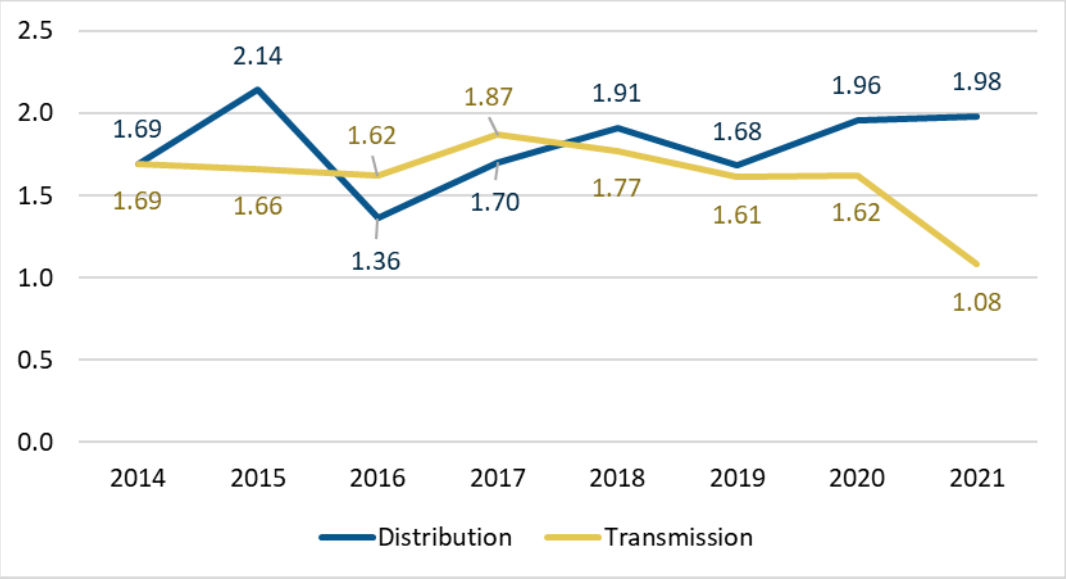


Source: AER data,[16] IEEFA analysis—combining both transmission and distribution network service provider supernormal profits for the 13 electricity distribution network areas.

The actual profit received by networks has been consistently higher than the normal profit throughout the period, as shown in the figure below, which shows the actual profit as a multiple of normal profit. If actual profit were equal to normal profit, the profit multiple would be one. However, it is consistently above one. **This shows that, across the sector, supernormal profits were extracted for every year of the period.**

[16] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

Profit Multiples Across Distribution and Transmission Networks by Year (actual profit as multiple of normal profit), 2014-2021



Source: AER data,[17] IEEFA analysis.

How Have Networks Been Able to Overcharge Consumers?

Networks have been able to overcharge consumers and extract supernormal profits, despite network prices being economically regulated by the AER. There has been an ongoing wealth transfer from Australian energy consumers to the owners of Australia's energy networks, including overseas owners.

How did this happen when network prices are regulated? Actual network costs were persistently lower than the estimated costs used to set regulated prices, over 2014-2021 (80% of the two five-year revenue control periods). The total impact of these overestimated costs was not being disclosed publicly for most of the period. Errors in estimation methods were not comprehensively tackled during five-yearly price resets. Consumers were charged for network service provider (NSP) "costs" that did not exist.

Actual network costs were persistently lower than the estimated costs used to set regulated prices, over 2014-2021.

For the most part, estimation errors do not reflect the information advantages of networks relative to the regulator, under effective incentive regulation. Instead, they

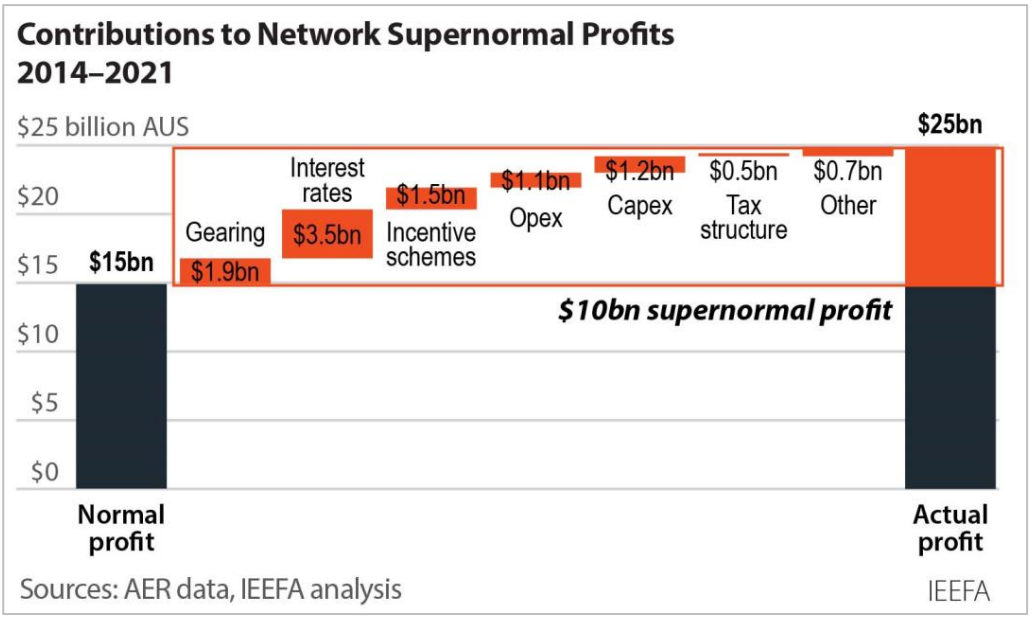
[17] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

reflect ongoing decisions by the regulator to retain theories and assumptions to estimate key costs, rather than using data and evidence.

A further contributing factor is that the regulator was unable to correct some estimation errors as a result of successful legal proceedings initiated by networks. The main costs that were overestimated were financing costs (interest rates), opex, capex and tax. Overly generous network productivity and performance reward schemes (called "incentive schemes") also contributed to sector-wide supernormal profits.

The sources of the variances between the normal profit and the actual profit, resulting in the supernormal profit over the eight-year period are shown in the figure below. The actual profit received by networks was 67% higher than the normal profit level over the period.

Incremental Contributions to Supernormal Profits, 2014-2021



Source: AER data; IEEFA analysis. Derived from Figure 4.6 of AER. Electricity network performance report 2022, p. 32.

For the cost buckets below, networks charged consumers more than required to cover their actual costs.

- **Gearing:** Gearing refers to the proportion of finance raised from different sources—debt and equity. It is expressed as a ratio of debt to equity. The total cost of capital is affected by the gearing ratio. The AER used and continues to use standardised gearing assumption for all NSPs to determine the total revenue required by NSPs. The gearing contribution to supernormal profits may reflect NSP decisions to maximise supernormal profits from other contributing factors by adjusting their gearing ratios.

- **Interest rates:** Some of the contribution to supernormal profits from lower interest rates reflects falling interest rates and the methodology used to estimate future debt servicing costs. However, some of this contribution reflects ongoing decisions to apply benchmark credit ratings in the bottom third of investment grade ratings, that do not correspond to actual credit ratings and debt financing charges.

- **Incentive schemes:** The AER rewards networks for productivity and innovation through incentive schemes. However, incentive payments for average or below average performance and efficiency appear to have resulted in sector-wide over-compensation under these schemes.

- **Opex:** The AER's estimates of efficient operating expenditure (opex) appear consistently too high. These estimates are constrained by limited data, including on vegetation management and other environmental factors that vary between networks, making it difficult to estimate the extent to which differences in opex between networks reflect differences in performance.[18]

- **Capex:** As shown in the AER's 2021 network performance report, total NSP capital expenditure (capex) over the 2014-2021 period underspent allowances for five out of the eight years, contributing to supernormal profits for both transmission and distribution.

- **Tax:** The AER identified problems with its benchmark methods for estimating tax in a 2018 review,[19] drawing on data provided by the Australian Tax Office. Before this change, tax allowances significantly exceeded actual tax costs.

- **Other:** It appears there were further costs that were overestimated by the AER and networks that also contributed to supernormal profits for networks.

Economic Regulation of Energy Networks Is Not Effective

The AER's explanation of network profits relies on a theory regarding information advantages ("rents") held by networks even under effective incentive regulation. This theory is applied to estimate efficient supernormal profits based on a multiple of the total value of the network regulatory asset base (RAB) being financed by debt and equity.

However, it is an incomplete explanation because it overlooks the fact that debt holders financing around 60% of RABs do not benefit from supernormal profits. Supernormal profits are received by equity holders financing around 40% of RABs implying that supernormal profits should not be compared with RABs but with a normal return on equity for around 40% of RABs.

[18] S. Orme et al. Independent review of Operating Environment Factors used to adjust efficient operating expenditure for economic benchmarking. Australian Energy Regulator. 2018. Page 66.
[19] AER. Final report: Review of regulatory tax approach. December 2018.

This report finds that, on reviewing network profitability data, and the AER's incomplete explanation of persistent and substantial supernormal profits:

- Actual profits exceeding normal profits by 1.7 times over 2014-2021 does *not* appear consistent with Objective 3 in the AER's Strategic Plan 2020-2025 for "ensuring that consumers pay no more than necessary for the safe and reliable supply of electricity network services".[20]
- An assessment of individual contributions of various cost buckets to overall supernormal profits reveals the persistent application of false theories and incorrect assumptions, in place of data for estimating costs and revenues, and not reasonable information "rents" under effective incentive regulation.
- When considering the reasonableness of supernormal profits, normal profits attributable to shareholders are the appropriate benchmarks for assessing whether returns to shareholders are commensurate ("correspond") with regulatory and commercial risks in providing network services (National Electricity Law [NEL], section 7A(5)). Using this benchmark, actual profits exceeded normal profits by a multiple of 1:1.7 (NEL, section 7A(5)).
- There are no reliability benefits from persistent large supernormal profits since all supernormal profits are measured after reinvestment in regulated networks (NEL, section 7A(6)), and overinvestment reduces reported profits.
- Persistent and large supernormal profits have contributed to increased investment in and use of substitutes for network services by consumers, resulting in widespread underutilisation of network assets (NEL, section 7A(7)).
- Inefficiencies from excessive network prices, and wealth transfers created by persistent sector-wide supernormal profits, are impeding the energy transformation. The $10 billion supernormal profits over just eight years is approaching the estimated regulated transmission investment requirements in the Australian Energy Market Operator's (AEMO) Integrated System Plan for assets with expected lives greater than 50 years.[21]

Inefficiencies from excessive network prices, and wealth transfers created by … supernormal profits, are impeding the energy transformation.

Considering sector-wide outcomes over a majority of two regulatory control periods alongside the factors that resulted in persistent supernormal profits, consumers

[20] AER. AER Strategic Plan 2020-2025. 2020.

[21] The 2022 Integrated System Plan (ISP) is forecasting $12.8 billion in new transmission investment will be required to achieve the ISP's Optimal Development Path (ODP). Australian Energy Market Operator. 2022 Integrated System Plan. June 2022. Page 15.

have clearly been paying substantially more than necessary for safe and reliable regulated energy network services.

Economic regulation of electricity networks across most of Australia over 2014-2021 has consistently failed to prevent networks from setting prices well above their total costs and generating sustained and substantial supernormal profits. In IEEFA's view, this outcome appears inconsistent with the National Electricity Objective and the revenue and pricing principles in the National Electricity Law.

Impact on Efficient Investment and Use of Electricity

Persistent and excessive supernormal profits mean that overall retail electricity prices are currently higher than necessary. Higher prices inefficiently suppress demand for network services and encourage higher than efficient investment in non-network alternatives, including consumer energy resources. High network prices have already contributed to the widespread underutilisation of existing network capacity and excess network capacity. This, in turn, has adversely affected the overall productivity of the sector.

Supernormal profits transfer wealth and result in deadweight losses, reducing the gross domestic product and the international competitiveness of Australian exports and import substitutes. Supernormal profits may lead to consumers investing in substitute assets and services at higher than optimal levels, reducing the utilisation of network assets. As a result, supernormal profits reduce dynamic and overall economic efficiency over the long run.

Supernormal profits are not being reinvested in higher levels of regulated capital investment, as assumed in many assessments of the costs and benefits of supernormal profits. Instead, shareholders are retaining them, including in the form of dividends.

This means that financial resources that could fund investment in the energy transformation are being diverted by wealth transfers from consumers to network shareholders, many of whom are overseas. This delays and raises the cost of the energy transformation.

Unless corrected, the total costs to consumers from the profit component of future regulated transmission investment would be 85% higher than the normal profit level over the typical 50-year life of major transmission assets. This would increase the cost of the energy transformation and deter investment in low carbon generation.

Substantial resources are being diverted from the energy transformation and investment and usage outcomes are being distorted by excessive network prices.

How to Fix the Issue

Fast and effective action is required to improve economic regulation so that it constrains network supernormal profits.

We recommend that the Australian Government establish an independent commission of inquiry into the performance of NEM institutions and arrangements, working jointly with participating NEM jurisdictions.

The commission's first step should be to recognise that network economic regulation outcomes for 2014-2021 were inconsistent with the National Electricity Objective. So far, there has been no recognition that economic regulation has failed. As a result, there is currently no impetus to address the causes of this failure.

The next step is to introduce effective performance metrics, reporting and monitoring arrangements for the energy market bodies involved. Clear performance metrics should be established for each organisation based on ensuring that sector-wide regulated network revenues more or less match total costs. Regular outcomes-based reporting and monitoring should be undertaken to ensure that supernormal profits are limited to networks that outperform efficient benchmarks.

Outcomes-based reporting and monitoring should be undertaken to ensure that supernormal profits are limited to networks that outperform efficient benchmarks.

The commission should also work on making a comprehensive set of changes to the National Electricity Law and Commonwealth accountability arrangements for the AER to improve the economic regulation of networks. In IEEFA's view, this should include the following:

- Establish a clear outcomes-based performance evaluation framework within the National Electricity Law for the AER's economic regulation of networks, including how AER is performing against Objective 3 of its Strategic Plan 2020-2025 of "ensuring that consumers pay no more than necessary for safe and reliable electricity".[22]

- Require regular and full disclosure of actual profits by networks and consolidation and assessments by the AER in annual network performance reporting, similar to disclosure requirements imposed on retailers under the Retailer Reliability Obligation. This would also support regular review of network regulation outcomes by the relevant Auditors-General on behalf of National Electricity Law member parliaments.

- Amend the revenue and pricing principles to clarify what constitutes a reasonable risk-adjusted return to equity investors, including by clarifying

[22] AER. AER Strategic Plan 2020-2025. 2020.

that the actual (real) return on equity is the principal performance metric under the National Electricity Law and incentive regulation, not the estimated return on equity.

- Remove the current unfounded suggestion in the revenue and pricing principles that higher (lower) network profits result in increased network investment and, therefore, higher (lower) reliability.

- Change the rate of return instrument (RORI) provisions in the National Electricity Law to allow the 2022 RORI outcome to be amended in 2023. This is to correct a continued reliance in the draft RORI on a false capital pricing theory and use of incorrect assumptions instead of data. Amendments to the 2022 RORI process should be implemented without the usual delay of up to five years. In IEEFA's view, the past delayed implementation of RORI to estimate the allowed RROE is based on the false assumption that network RROE outcomes are consistent with the revenue and pricing principles and the National Electricity Objective—they are not persistently excessive. Correcting errors in the RORI without the usual delay of five years would not be equivalent to "regulatory takings", since to IEEFA's understanding, networks do not hold legal rights to persistent supernormal profits.[23] IEEFA considers that the immediate correction to the RORI is required under the revenue and pricing principles to prevent future supernormal profits for up to five years after a corrected 2022 RORI is handed down in 2023.

- Improve the design and operation of incentive schemes and data used to estimate cost building blocks, to prevent cost overestimation resulting in continued supernormal profits.

- Introduce a safeguards mechanism establishing that persistent and excessive supernormal profits unrelated to productivity and performance are returned to consumers.

Current barriers to the effective participation of consumer representatives in regulatory processes should be removed. These barriers include insufficient information on supernormal profits, errors in the data and methods used to set the RORI and the refusal by Energy Consumers Australia to support research into excessive supernormal network profits on three occasions since 2018.

Current barriers to the effective participation of consumer representatives in regulatory processes should be removed.

[23] The doctrine of regulatory takings does not strictly apply in Australia but is sometimes presented in various forms as an argument that correcting previous regulatory errors raises equity financing costs and hence is not in the long-term interests of consumers.

To ensure frameworks for future investment, including energy transformation investment, new jurisdictional schemes and the announced Rewiring the Nation Corporation are efficient, it will be necessary to ensure they do not contribute to excessive network supernormal profits.

A wider review of the performance of economic regulation should be undertaken—looking at sectors outside of the energy sector. Other economic regulators rely on false corporate finance theories in setting regulated prices for major infrastructure services. The commission should identify whether regulatory systems for monopoly infrastructure in other sectors also result in excessive supernormal profits and adversely affect consumers and international competitiveness.

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List of Figures and Tables

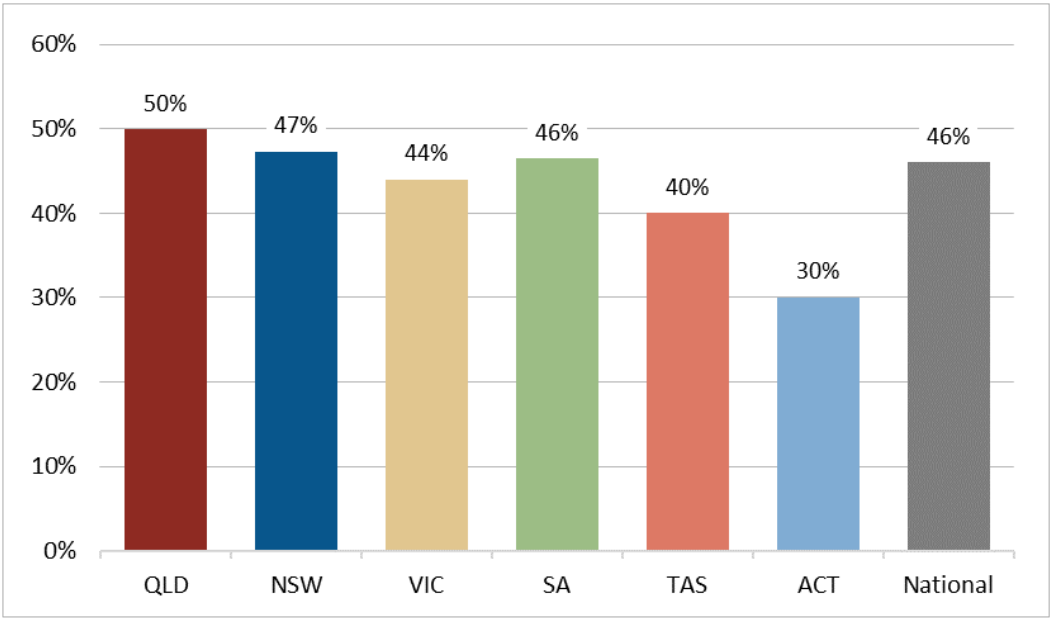
1 Context

1.1 Why Network Regulation Matters Now

Electricity networks are traditionally natural monopolies. It is not economic to duplicate most network assets. In Australia, networks are also statutory monopolies with exclusive licences within franchise areas. This means that networks have pricing power, including the opportunity to set prices above total costs.

Network regulation matters because around $100 billion[24] of electricity network assets are subject to direct economic regulation. Network regulation matters because, according to the Australian Competition and Consumer Commission (ACCC), in 2020-21, network costs were the single largest component of power bills for residential and small business customers and made up more than a third of power costs for large commercial and industrial customers, as shown in Figure 1.[25]

Figure 1: Bill Impact of Regulated Network Charges (% of retail bill), 2020



Source: AER 2021[26]
Note: Western Australia is not part of the National Electricity Market and is excluded from this analysis. AER data for the Northern Territory is not available for the entire period.

1.2 Regulated Energy Networks

Transmission and distribution network service providers own and operate the poles and wires of the National Electricity Market (NEM). Transmission and distribution

[24] AER. State of the Energy Market Report 2021. 2 July 2021.
[25] Australian Competition and Consumer Commission. Inquiry into the National Electricity Market 2021. 13 December 2021. Page 4.
[26] Derived from AER. State of the Energy Market Report 2021. 2 July 2021. Page 269, Table 6.2.

networks in the NEM were originally publicly owned. Various parts of the networks were privatised in the 1990s.

Now, some networks are in public hands, and others are privately owned.

- Electricity networks in Tasmania and Queensland are 100% government-owned.
- Electricity networks in Victoria and South Australia are 100% privately owned.
- In New South Wales (NSW), one electricity network is privately owned, two are 50.4% privately owned, and one is fully government owned (Essential).
- The Australian Capital Territory's (ACT) electricity network is a joint public and privately owned entity.[27, 28]

Network Service Providers (NSPs) are the companies responsible for building, maintaining, planning and operating the networks. Transmission network service providers (TNSPs) control transmission networks, and distribution network service providers (DNSPs) control distribution networks. Similarly, gas distribution and some gas transmission NSPs are also regulated.

1.3 System for Regulating Energy Network Prices

Electricity networks in Australia are subject to economic regulation under the National Electricity Law (NEL) and supporting National Electricity Rules (Chapter 6 and Chapter 6A). Economic regulation refers to rules that limit who can enter a business (entry controls) and what prices they may charge (price controls).[29]

Networks were originally economically regulated by State and Territory regulators. However, in 2005, a new federal regulator was created—the Australian Energy Regulator (AER). The AER works within rules set by the Australian Energy Market Commission (AEMC). The AEMC sets rules within the NEL and may be directed by the Council of Australian Governments (CoAG) Energy Council. AER decisions may be subject to review by the Australian Competition Tribunal, which is a Commonwealth entity. The NEL is State and Territory legislation for NEM participants, and not Commonwealth law.

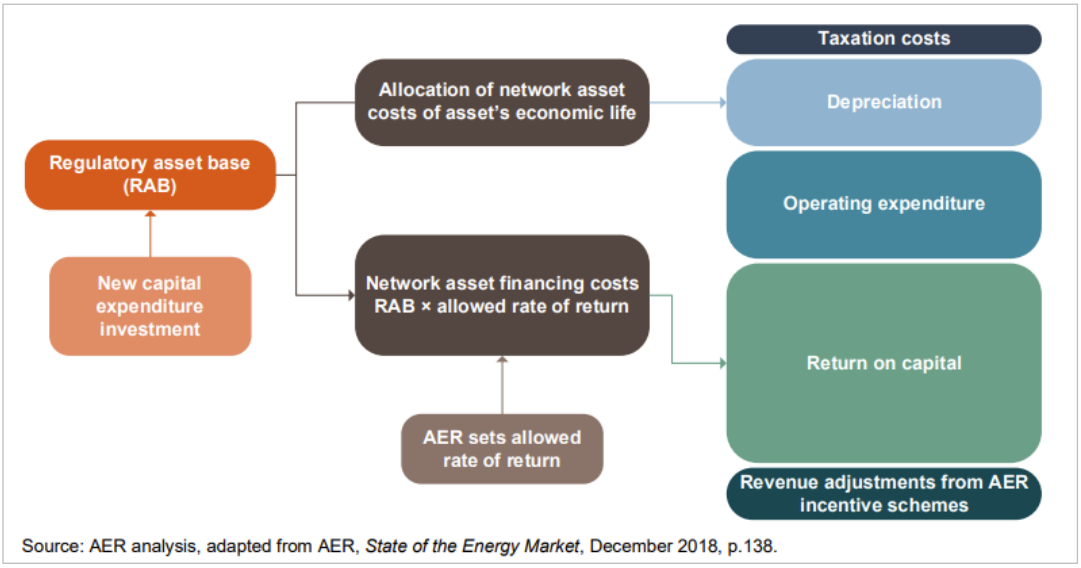
1.4 How Regulation Works

Following pricing proposals from the networks and considering submissions from consumers and others, the AER determines the estimated, efficient level of future revenue that may be recovered from consumers by the NSPs, in the form of network prices. The AER applies a standard regulatory model to estimate each

[27] Energy Networks Australia. Guide to Australia's Energy Networks.
[28] Note, Western Australia was excluded from this analysis as it is not part of the National Electricity Market. The networks in Western Australia and the Northern Territory are 100% government owned. AER data for the Northern Territory is not available for the entire period.
[29] Econlib: Robert Litan. Regulation. Accessed 2 September 2022.

NSP's total revenue requirement. This is known as the "building block" model, summarised in Figure 2.

Figure 2: The Building Block Model to Forecast Network Revenue



Source: AER. Electricity network performance report 2022, p. 8.

The cost building blocks are the return on capital, operating expenditure, depreciation and taxation costs. Incentives are also added to, or subtracted from, the total allowed revenue. The return on capital building block is estimated by multiplying the regulatory asset base (RAB) by the allowed rate of return. The RAB includes both existing assets, adjusted for depreciation, and capital expenditure for augmentation and replacement of network assets. The depreciation allowance is also derived from the RAB, adjusted for the depreciated residual value of the assets.

Box 1: Explanation of Regulated Revenue — Extracted from AER 2022 Report[i]

All electricity NSPs are now regulated under revenue caps. NSPs annually set their prices to target earning the maximum revenue allowed under the revenue cap. We set the maximum allowed revenue so NSPs can recover the costs of an efficient network providing core regulated services.

These are determined as 'building blocks', and include:

- *A return on the RAB (or return on capital, to compensate investors for the opportunity cost of funds invested in the NSP).*
- *Depreciation of the RAB (or return of capital, to return the initial investment to investors over time).*

- *Forecast capital expenditure (capex) incurred in providing network services, which then enters the RAB and depreciated over the economic life of the asset.*
- *Forecast operating, maintenance and other non-capital expenses (opex) incurred providing network services.*
- *The estimated cost of corporate income tax.*
- *Revenue adjustments, including revenue increments or decrements resulting from applying incentive schemes.*

We also update the revenue target each year to account for actual inflation, changes in the NSP's required returns on debt, cost pass throughs and other factors.

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[i.] *AER. Electricity network performance report 2022. 15 July 2022. p. 8.*

Box 2: Explanation of RAB — Extracted from AER 2022 Report[ii]

RABs capture the total economic value[iii] of network assets that NSPs use to provide regulated network services. Over time, the RAB grows as NSPs undertake capex. RAB values substantially affect NSPs' revenue requirements, and the total costs consumers ultimately pay. This is because consumers pay the costs of raising capital through the return on capital (calculated by applying the allowed rate of return to the RAB) and return of capital (depreciation) allowances. We also inflate the RAB each year to reflect the impacts of inflation. This increases the nominal value of the assets to maintain their real value through time.

Network assets in the RAB have been accumulated over time and will be at various stages of their economic lives. Some NSPs' average asset lives may be relatively old or young, depending on their growth and their phase of the replacement cycle.

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[ii.] *AER. Electricity network performance report 2022. 15 July 2022. p. 3.*

[iii.] *This is strictly not correct. See Section 3.7 'Not All Supernormal Profits Are Measured', discussing the Optimised Depreciated Replacement Cost (ODRC) method of determining the economic value of the RAB compared with the limitations of the roll-forward method used by the AER.*

Regulatory periods in Australia usually are five yearly. Every five years, the AER determines the revenue the networks require to cover their costs for the next five-year period. The AER applies revenue smoothing to avoid price and revenue volatility from year to year throughout the five years.

Within each year of a regulatory period, the AER makes certain adjustments to the inputs used to calculate the total allowed revenue and hence network prices for the following year. Adjustments include actual inflation and updated forecasts using actual consumption volumes for the current period. This means that any over-recovery or under-recovery of costs in one period is supposed to be corrected over the following periods.

In 2018, changes were made to the NEL to create the mandatory rate of return instrument (RORI). The RORI sets the allowed return on the capital cost building block and is, therefore, a key determinant of overall network revenues. The 2018 RORI has still not yet taken full effect, as it only applies to the following revenue control period for each network. The 2022 RORI process is nearing completion. The two components of the return on capital are the return on debt and return on equity. The inflation-adjusted (real) return on equity (RROE) represents the return to equity shareholders in the relevant NSP.

The RROE is the net profit after tax divided by regulated equity. Regulated equity is the portion of the RAB assumed to be financed by equity. Net profit after tax is after capital expenditure and estimated financing risk—both debt and equity.

Any variances between the estimated and actual costs in the building blocks explained above flow to the RROE and, hence, to shareholders. This is known as incentive regulation.

Under incentive regulation, regulated entities may outperform (or underperform) the target return on equity (the normal shareholder profit level) by reducing one or more of operating expenditure, depreciation, debt financing or tax cost building blocks, relative to regulatory allowances. They may also outperform (underperform) the normal profit level by exceeding performance benchmarks set out in performance incentive schemes.

Incentive regulation is intended to reward or penalise shareholders relative to the AER's efficient cost and performance benchmarks. These incentives should benefit consumers because they reveal the NSP's efficient costs (and any errors in regulator estimates) and how they change over time. Provided this information is monitored, actual performance data can be reflected in decisions for setting new efficient cost benchmarks for the following regulatory price control period.

Actual performance data can be reflected in decisions for setting new efficient cost benchmarks for the following regulatory price control period.

Because networks have an information advantage regarding costs and how efficient costs change over time, an inherent feature of the system may be a modest positive margin between the estimated and actual RROE in favour of NSPs. This reflects a typical delay between the change in cost and the change in the regulator's estimates of cost—known as "information rents". However, information rents should be limited as effective regulation would track changes in cost and implement changes in the following five-year period. Over time and across the entire sector, the estimated and actual RROE would be expected to be only slightly positive in favour of NSPs sector wide.

If there is a large and structural difference between estimated and actual RROE across the entire sector, this implies an abnormal level of profits (or losses). Sustained and structural supernormal profits indicate that economic regulation is not constraining networks from exercising pricing power.

1.5 Networks and the Energy Transformation

Substantial new network investment is required to support the energy transformation. This includes improving existing transmission capacity and extending the transmission system to support the large-scale entry of renewable generation and storage, including for renewable energy zones.

New network investment is required to support the energy transformation.

The 2022 Integrated System Plan (ISP) forecasts that $12.8 billion in new transmission investment will be required to achieve the ISP's Optimal Development Path (ODP).[30] The 2022 ISP also foreshadows significant distribution network investment to support coordinated consumer energy resources.[31] Substantial additional investment is also required for renewable energy zones to connect to the main grid.

The NSW government has appointed the AER as the regulator under the NSW Electricity Infrastructure Roadmap.[32] Key functions include undertaking a Transmission Efficiency Test and revenue determinations, and making Contribution Determinations. The AER has decided that costs associated with the NSW Roadmap satisfy the criteria for a jurisdictional scheme, allowing Roadmap costs to be recovered from regulated network charges.

The AEMC is undertaking a review of transmission planning and investment. Among other things, the AEMC has recommended changes to the AER's building block methodology to vary the depreciation profile for actionable ISP transmission

[30] Australian Energy Market Operator. 2022 Integrated System Plan. June 2022. Page 15.
[31] Consumer energy resources include rooftop solar, electricity storage (batteries and electric vehicles) and other energy efficient consumer plant and equipment.
[32] AER. NSW Renewable Energy Zones. 2022.

projects to address suggested financeability challenges.[33] These challenges arise due to asset depreciation charges commencing from the date of commissioning rather than when capital expenditure is incurred.

The Australian Government intends to establish a new Rewiring the Nation Corporation (RNC) to invest $20 billion to rebuild and modernise the grid.[34] The stated purpose of the RNC is to partner with industry to ensure low-cost finance to build the ISP developed by the Australian Energy Market Operator.

Similarly, the NSW government announced the establishment of the Transmission Acceleration Fund (TAF).[35] The fund will accelerate key transmission projects, including two renewable energy zones and the Hunter Transmission Project.

The RNC and TAF highlight the importance of electricity networks in the energy transformation. Unless new network capacity is rapidly deployed, the amount of energy being delivered to customers from existing and new renewable generation is limited. As a result, new renewable generation investment is deterred and delayed. The role of the RNC and TAF is to support the faster deployment of new transmission capacity. This will remove a key barrier to investment in renewable generation.

Delayed generation investment due to transmission bottlenecks means that coal and gas plants need to remain in service longer. Australian wholesale electricity prices will continue to be buffeted by volatile and currently historically high energy prices for longer. Carbon and other harmful pollution will be much greater and continue for longer.

1.6 Assumption that Network Regulation Is Effective

Most commentary takes for granted that economic regulation of electricity network monopolies in Australia is effective in constraining prices to match total costs. Until 2021, data necessary to assess the effectiveness of economic regulation has not been made available by NSPs or the AER.

Network prices were not identified as a problem in the ACCC's November 2021 and May 2022 reports for its ongoing retail electricity price inquiry.[36] The 2021 ACCC report highlighted that network returns have fallen in line with interest rates but did not identify the persistence of supernormal profits alongside falling interest rates.

The decision to establish the RNC in part reflected concerns that network prices were above costs. This decision was criticised in an article published by the Energy

[33] Australian Energy Market Commission. Stage 2 Draft Report transmission planning and investment review. 2 June 2022.
[34] Australian Labor Party. Rewiring the Nation, More jobs, lower power prices. 2021.
[35] NSW Government. $1.2 billion to fast track renewable energy zones. 10 June 2022.
[36] Australian Competition and Consumer Commission. Inquiry into the National Electricity Market – May 2022 report. 20 June 2022. And: Australian Competition and Consumer Commission. Inquiry into the National Electricity Market - November 2021 report. 13 December 2021.

Networks Australia on the basis that the facts do not support the assertion that network returns to network shareholders are too high.[37]

While the commentary states it is a fact check, it does not refer to any facts about Australian regulated network returns. It points instead to a 2020 consultant report for the AER finding that Australian estimated (not actual) network returns are much lower than in comparable jurisdictions.[38] In line with its terms of reference, the Brattle report looks only at the AER's *estimates* of the efficient real (inflation-adjusted) return on equity (or estimated RROE), not the expected RROE from *actual* RROE data.

Similarly, the AEMC's analysis of a possible shortfall in transmission networks' ability to finance structurally higher capital expenditure levels for the energy transformation assumes that economic regulation is effective. The AEMC review appears to accept that networks have limited ability to increase their gearing ratios above 60%.[39]

Is the assumption that economic regulation is effective valid? Are network returns consistent with the revenue and pricing principles in the NEL?[40] If not, what are the implications for the energy transformation, including the formation of the RNC and TAF? These and related topics are addressed in the remainder of this report.

[37] Energy Networks Australia. Fact Check: Rewiring the nation. 15 October 2020.
[38] The Brattle Group. A Review of International Approaches to Regulated Rates of Return. June 2020.
[39] Australian Energy Market Commission. Stage 2 Draft Report transmission planning and investment review. 2 June 2022. P. 15.
[40] NSW Government. National Electricity (NSW) Law No 20a of 1997. Current version for 20 May 2021 to date (accessed 2 September 2022).

2 Information Source: AER Network Profitability Data

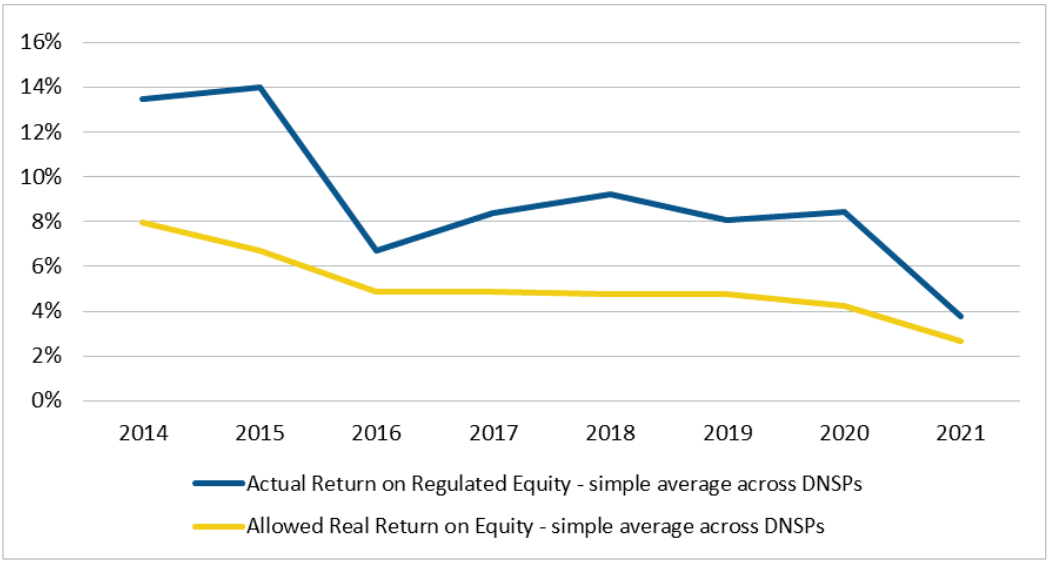
2.1 AER Return on Equity Data — 2021 and 2022

The AER released electricity network real return on equity (RROE) data for the period 2014-2020 for the first time in September 2021, alongside the 2021 electricity network performance report.[41] This included 140 observations of RROE from 18 NSPs, including both TNSPs and DNSPs, over seven years. The data are provided in the form of excel spreadsheets.

The 2021 data release was supplemented in July 2022, alongside the 2022 electricity network performance report, to include RROE data for 2021 for 14 out of 18 NSPs, giving 140 RROE observations over eight years.[42] The July 2022 data is used as the basis for this report. RROE data for gas NSPs continues to be unavailable.[43]

The AER released actual return on regulated equity data and allowed real return on equity data. The simple average of the allowed and actual RROEs for distribution networks and transmission networks is shown in Figures 3 and 4, respectively. The AER data shows that actual return has consistently been above the allowed return.

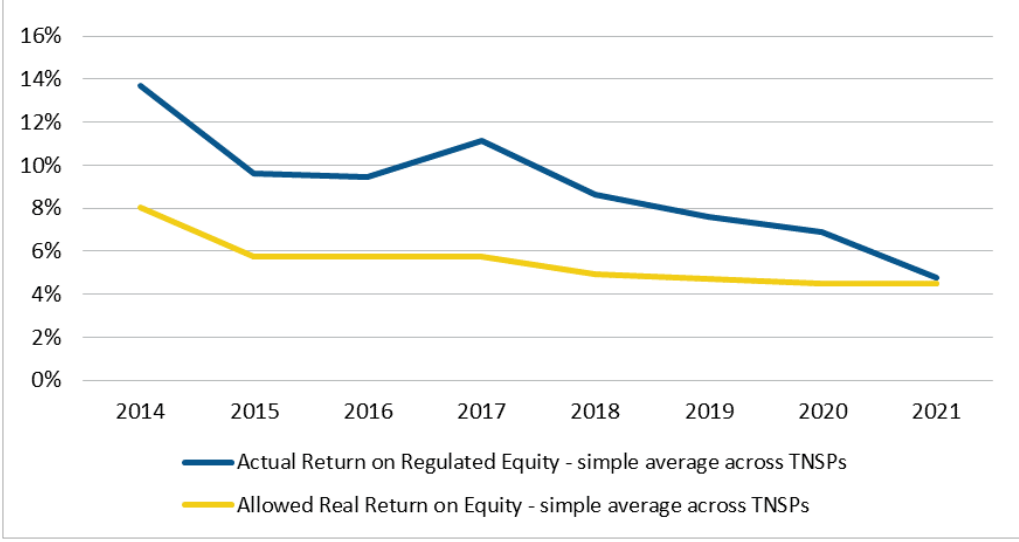
Figure 3: Distribution Networks — Actual Return on Regulated Equity vs Allowed Real Return on Equity



Source: AER data accompanying 2022 network performance report.[44]

[41] AER. Electricity network performance report 2021. Financial performance data 2021 - Electricity networks – Public. 22 September 2021
[42] AER. Electricity network performance report 2022. Financial performance data 2022-Electricity networks. 15 July 2022.
[43] AER. Gas network performance report 2021. 22 December 2021.
[44] AER. Electricity network performance report 2022. Financial performance data 2022-Electricity networks. 15 July 2022.

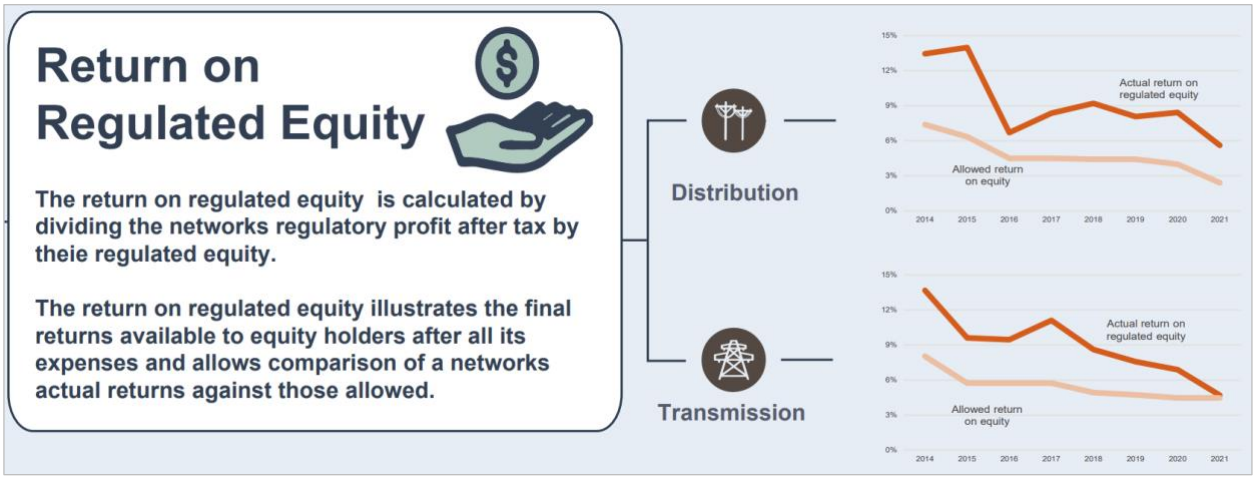
Figure 4: Transmission Networks — Actual Return on Regulated Equity vs Allowed Real Return on Equity



Source: AER data accompanying 2022 Network performance report.[45]

An AER infographic summarising the 2022 electricity network performance (Figure 5) indicates the discrepancy between actual and allowed returns.

Figure 5: AER Return on Regulated Equity Explainer, 2021

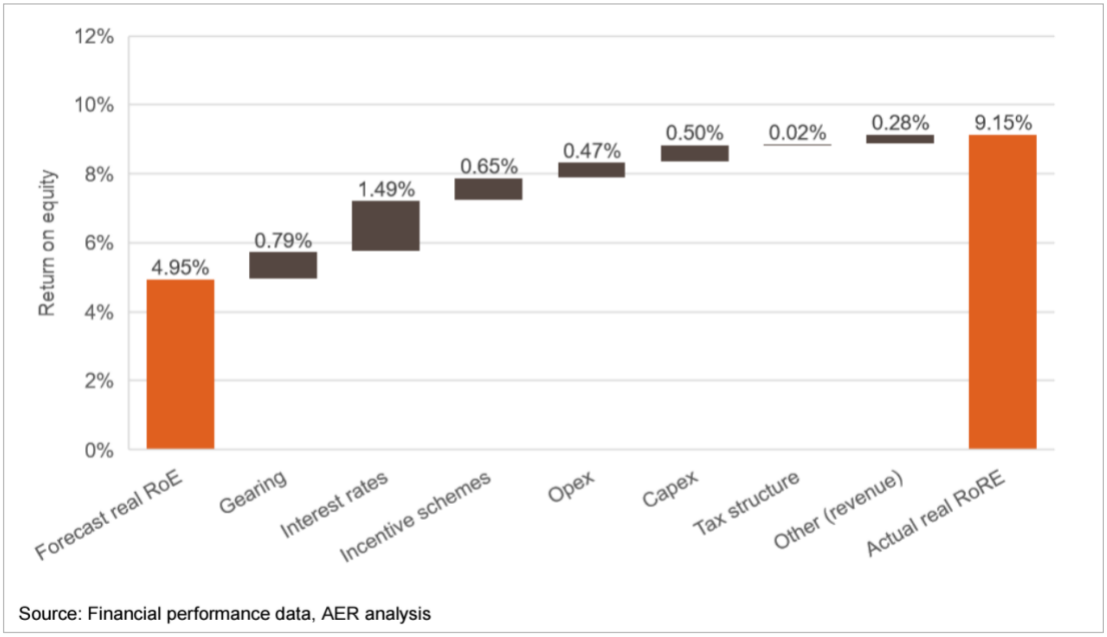


Source: AER. Electricity Networks in 2021 (from Electricity network performance report 2022), p. 5.

[45] AER. Electricity network performance report 2022. Financial performance data 2022-Electricity networks. 15 July 2022.

The AER also released a chart expressing the variation between allowed and actual returns in the 2022 network performance report. The data was presented in percentage terms (Figure 6). It shows that networks received higher returns on equity than forecast — the forecast RROE was 4.95% and the actual RROE was much higher, at 9.15%. The data in Figure 6 has been used as the basis for this report, to understand the factors that drove profits to be higher than originally forecast.

Figure 6: Incremental Contributions to Returns on Regulated Equity — Simple Average of All NSPs Over 2014-2021



Source: AER. Electricity network performance report 2022, p. 32.

The 2022 AER report accompanying the release of the RROE data emphasised the reduction in allowed network returns over 2014-2021.[46] The 2021 AER report also noted that network returns declined over the period. The 2021 AER report also provides comments on network profits from 2014 to 2020 (Box 3). The AER noted that networks achieved returns on equity exceeding the forecast returns.

While the AER network performance reports from 2021 and 2022 show that network returns were higher than forecast, the AER did not include an assessment of whether these outcomes were consistent with Objective 3 in the AER's Strategic Plan 2020-2025 that "consumers pay no more than necessary for the safe delivery of reliable electricity and gas network services".[47] There is no suggestion in the AER reports that this objective may not have been achieved over 2014-2021.

[46] AER. Electricity network performance report 2022. 15 July 2022.
[47] AER. AER Strategic Plan 2020-2025. 2020.

Box 3: AER Commenting on Network Returns, 2014-2021 — Extracted from AER 2021 Report[iv]

Over 2014 to 2020:

- *Average electricity network returns on regulated equity declined materially*
- *Despite this, electricity networks achieved returns on regulated equity which exceed forecast returns on equity by approximately 4.2%*
- *This occurred against a backdrop of declining forecast returns on equity. This decline has progressed as:*
  - *interest rates have declined, including the rates on Commonwealth Government Securities based on which we forecast the risk-free rate*
  - *we have applied the 2013 rate of return guideline and, from 2020, have begun to apply the 2018 binding rate of return instrument. So far, the 2018 instrument has applied to five DNSPs and one TNSP.*
- *The difference between forecast and real returns was higher in the earlier years and narrowed materially after the introduction of the 2013 rate of return guideline.*

—

[iv] *AER. Electricity network performance report 2021. 22 September 2021. p. 61.*

2.2 Investigation of "Persistent Outperformance"

In the 2021 electricity network performance report, the AER stated that, "there is some evidence of persistent outperformance which we are investigating through our pathway to the 2022 binding rate of return instrument".[48]

At present, it appears that the process for the 2022 RORI has not considered network RROE outcomes over the period 2014-2021. In the rate of return expert sessions held by the AER in February 2022 and in the associated publications,[49] there is no analysis of the implications of higher than forecast RROE for setting the ex-ante RROE. This is evident in the detailed agenda for the rate of return expert sessions.[50]

[48] AER. Electricity network performance report 2021. 22 September 2021.
[49] AER. Evidence session. February 2022.
[50] AER. Detailed agenda for rate of return expert sessions. 10 February 2022.

2.3 AER Explanation of "Persistent Outperformance"

So far, the AER has explained persistent supernormal network profits by referencing a theory regarding RAB multiples. Under this theory, information rents mean that the equivalent of cumulative supernormal profits of up to 30% of the RAB is reasonable.

The AER has so far not tested the RAB multiples theory against the revenue and pricing principles or the AER's stated objective of ensuring that consumers pay no more than necessary for safe and reliable network services. The AER has so far not disclosed the dollar size of supernormal profits or indicated the network price and retail bill impacts.

The AER has so far not disclosed the dollar size of supernormal profits or indicated the network price and retail bill impacts.

The AER explanation for persistent outperformance in its 2022 report is outlined below:[51]

> *The results appear consistent with the outcomes we observe in NSPs' returns on assets and in RAB multiples, giving us greater confidence in the outcomes of the measure.*
>
> *…*
>
> *It is not unexpected that NSPs' returns would exceed forecast returns under a regulatory framework that provided them with a reasonable opportunity to recover at least the efficient costs of providing core regulated services. However, whether these results are evidence of the framework operating effectively or not depends on the drivers and materiality of the results, including whether they are caused by:*
>
> - *Temporary revenue over-collections which will be passed back to consumers in the short-term*
> - *Departures from our benchmark financing structures through which some NSPs have taken on higher risk to achieve higher returns*
> - *NSPs spending less than forecast revenue building blocks due to efficiency gains*
> - *NSPs spending less than forecast revenue building blocks due to shortcomings in our approach to estimating network revenue requirements, or to forecasting errors that, if unbiased, might be expected to even out over time.*

[51] AER. Electricity network performance report 2022. 15 July 2022. Page 30.

The ongoing ACCC retail price inquiry is exploring network prices, and whether or not they are reasonable. The ACCC notes that network costs are driving long-term changes in retail electricity costs and were the major contributor to falling bills between 2013-14 and 2020-21.[52] However, the ongoing ACCC inquiry has so far not considered the AER evidence that network revenues persistently exceed total network costs.[53] This suggests the ACCC retail price inquiry broadly accepts the AER's explanation for persistent NSP outperformance.

2.4 What Is Missing from the AER Reports

The AER's publicly available explanation of network returns to date only discusses the percentage network returns, and how the actual returns have been higher than the forecast returns. However, there has been no publicly released analysis testing whether higher network returns are consistent with the revenue and pricing principles in the NEL.

The AER's publicly available explanation of network returns to date only discusses the percentage network returns, and how the actual returns have been higher than the forecast returns.

There has been no public disclosure of NSPs' profits in dollar terms, or a comparison of the actual profit received by NSPs with the forecast (normal) profit level. There has also been no analysis of the impact of supernormal profits on consumers' bills, to IEEFA's understanding.

This report fills these gaps. Section 3 details the profit received by networks in dollar terms, and the impact of higher-than-expected network returns on consumers' bills. Section 4 examines how networks were able to extract profit above forecast (normal) levels.

Section 5 assesses the AER's explanation of higher-than-expected network returns and considers whether the AER's explanation is sound. It also assesses whether the observed profit outcomes and impact on consumers' bills are consistent with the AER's stated objective that "consumers pay no more than necessary for the safe delivery of reliable electricity and gas network services".[54] The final part of Section 5 compares network profits with the revenue and pricing principles to draw conclusions on whether network regulation is effective in constraining NSP pricing power.

[52] Australian Competition and Consumer Commission. Inquiry into the National Electricity Market – November 2021 report. Page 15.
[53] Australian Competition and Consumer Commission. Inquiry into the national electricity market - May 2022 report. 20 June 2022.
[54] AER. AER Strategic Plan 2020-2025. 2020.

3 What Is the Bill Impact of the Network Profitability Data?

3.1 Reinterpretation of AER Network Profitability Data

The AER does not disclose the total cost and consumer bill impact in reporting the network returns data. It relies on a discussion of percentage variances, which appear small (see Figure 4.6 of the AER's 2022 electricity network performance report),[55] and a discussion of RAB multiples without assessing the consumer bill impacts.

This section reinterprets the AER network returns data to determine the impact on consumers' bills. This provides part of the basis for a later discussion on whether network regulation is effective.

3.2 Revenues Exceed Total Costs by Nearly 11%

The AER has so far released percentage return on equity data for networks in July 2022, including both the forecast/"allowed" return on equity and the actual return on equity received.

The percentage real (inflation-adjusted) return on equity (RROE) data can be converted to dollar amounts to determine the profit received by networks' equity shareholders. This is done by multiplying the percentage return on equity by the regulated equity. Regulated equity can be found using non-inflation indexed RAB data, which was published by the AER alongside the RROE data.[56] The only assumption required to calculate regulatory equity is the gearing ratio. The gearing ratio has been assumed to be 60:40 (debt:equity), as that has been used by the AER to determine the allowed rate of return.[57]

The calculation method is shown below. The forecast, or "allowed" RROE, which is derived from the estimated weighted average cost of capital, can be converted into normal profit, indicating the normal amount of profit that would be received if the network return was as originally expected based on the AER's estimates. The actual RROE can be converted into actual profit, indicating the actual amount of profit that networks received based on the historical data. The difference between actual profit and normal profit is the supernormal (above normal) profit.

[55] AER. Electricity network performance report 2022. 15 July 2022.
[56] AER. Electricity network performance report 2022. Financial performance data 2022-Electricity networks. 15 July 2022.
[57] AER. Rate of Return Instrument – Explanatory Statement. 2018. Page 64.

$$Real\ return\ on\ equity\ (RROE) = \frac{Net\ Profit\ After\ Tax\ (NPAT)}{Non-indexed\ Regulated\ Equity}$$

$$Allowed\ real\ return\ on\ equity\ (Allowed\ RROE) = \frac{Normal\ Net\ Profit\ After\ Tax\ ("Normal\ Profit")}{Non-indexed\ Regulated\ Equity}$$

$$Actual\ real\ return\ on\ equity\ (Actual\ RROE) = \frac{Actual\ Net\ Profit\ After\ Tax\ (\text{"Actual Profit "})}{Non-indexed\ Regulated\ Equity}$$

$$Supernormal\ profit = Actual\ profit - Normal\ profit$$

$$Non-indexed\ Regulated\ Equity = Non-indexed\ Resource\ Asset\ Base\ (RAB) * 40\%$$

Table 1 shows that, once these additional calculations are made, the actual regulated network revenue was 110.8% of the actual regulated network cost over the period 2014-2021.

Table 1: Difference Between Electricity Network Revenue and Cost, 2014-2021

	$m (real)
Total actual regulated network revenue, including regulated capital expenditure and risk-adjusted return on capital	$102,745.5
Total actual regulated network cost, including regulated capital expenditure and risk-adjusted return on capital	$92,761.2
Supernormal profit (total revenue minus total cost)	$9,984.3
Total regulated network revenue as a percentage of total actual network cost	110.8%

Source: AER data,[58] IEEFA analysis.

[58] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The difference between revenue and expenditure represents a supernormal[59] profit, or windfall gain, of nearly $10 billion. **Consumers are being charged for NSP "costs" that do not exist.**

Consumers are being charged for [network service provider] "costs" that do not exist.

This outcome was measured from 140 RROE data points. The regulated cost includes risk-adjusted returns on capital (debt and equity) and all regulated capital expenditure.

The estimates assume a debt-to-equity ratio of 60:40, which is the assumption used to set total regulated revenue.[60] It excludes the overall positive profit impact of jurisdictional schemes and indexation of the RAB.

The supernormal profits relate only to regulated entities. Unlike RAB multiples, they do not include any components of firms' values unrelated to RABs.[61]

A distinction may be drawn between supernormal profits and excessive supernormal profits. This distinction is implicit in the Biggar range discussed in Section 5. In the meantime, the term 'supernormal' refers to all profits arising where revenues exceed total costs.

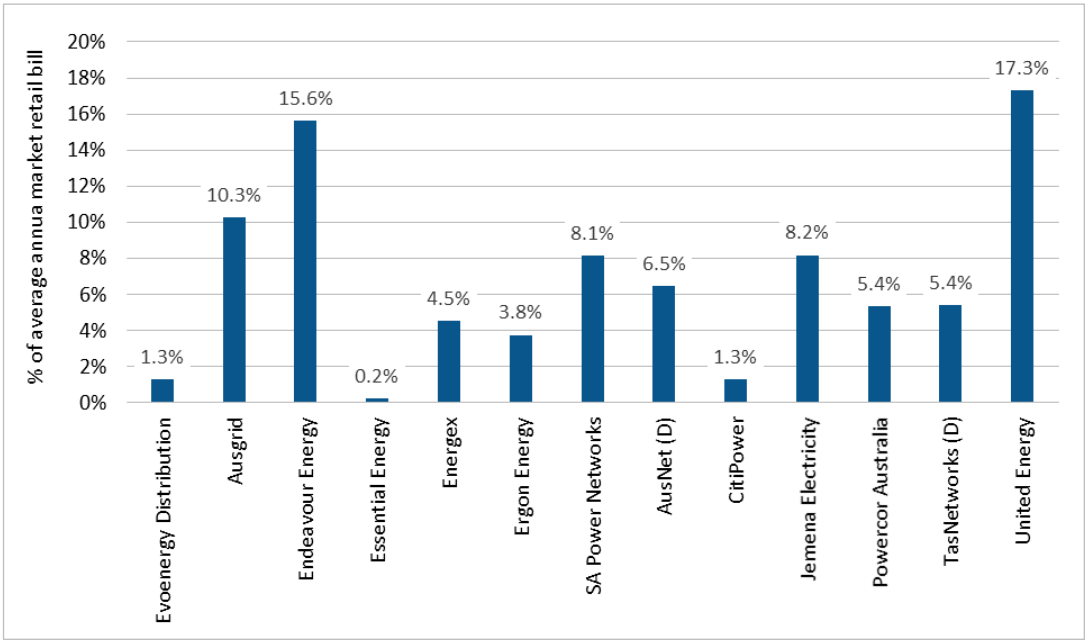
3.3 Bill Impacts of Supernormal Profits

The retail bill impact of combined supernormal profits (combining both TNSP and DNSP supernormal profits for the 13 electricity distribution network areas) for typical residential customers for 2020 is estimated Figure 7. On average, across all networks, 6.8% of unnecessary cost was added to customers' bills through the impact of supernormal profits. The range was wide: from 0.2% for Essential Energy to 17.3% for United Energy.

Alongside the NSP rate of return data used throughout this report, Figure 7 uses retail bill data from the AER 2021 state of the energy market report.[62] The 2022 state of the energy market report was not available when the modelling was undertaken for this report. While 2020 outcomes were affected by COVID-19, the impact for 2021 may have been greater. The bill impact of supernormal profits for 2020 is likely to provide a better indication of the long-term bill impact than 2021.

[59] A supernormal profit (loss) is defined here as revenue minus (plus) total cost. Total cost includes returns sufficient to compensate debt and equity financiers for the risk-adjusted opportunity cost of their investment. Supernormal profit/loss is interchangeable with economic profit/loss and monopoly profit (where positive).
[60] This is to avoid double counting the contribution of higher gearing (debt) to economic profits.
[61] That is, the ideal Biggar condition #2 applies – the supernormal profits relate only to RABs.
[62] AER. State of the energy market 2021. 2 July 2021.

Figure 7: Estimated Retail Bill Impact of Network Supernormal Profits, 2020, by Distribution Network (relative to average market retail bill)



Source: AER data,[63] IEEFA analysis—combining both transmission and distribution network service provider supernormal profits for the 13 electricity distribution network areas.

These estimates should be considered indicative only and include first-order impacts, only. Retailers would likely seek to include higher network costs in their markups on the cost of goods sold, in which case the bill impact would be greater than indicated here.

The impacts of supernormal profits on customers' bills have notably been largely avoided for the ACT (Evoenergy Distribution),[64] Essential Energy in regional NSW and CitiPower in Melbourne. This appears to reflect ownership arrangements and policy decisions by relevant governments. The NSW government owns Essential Energy, and the ACT government retains part ownership of Evo Energy.

3.4 Dollar Impact of Supernormal Profits Across the NEM

AS shown in Figure 8, supernormal profits are greatest in Victoria, NSW, and Queensland and non-existent in the ACT (distribution only).

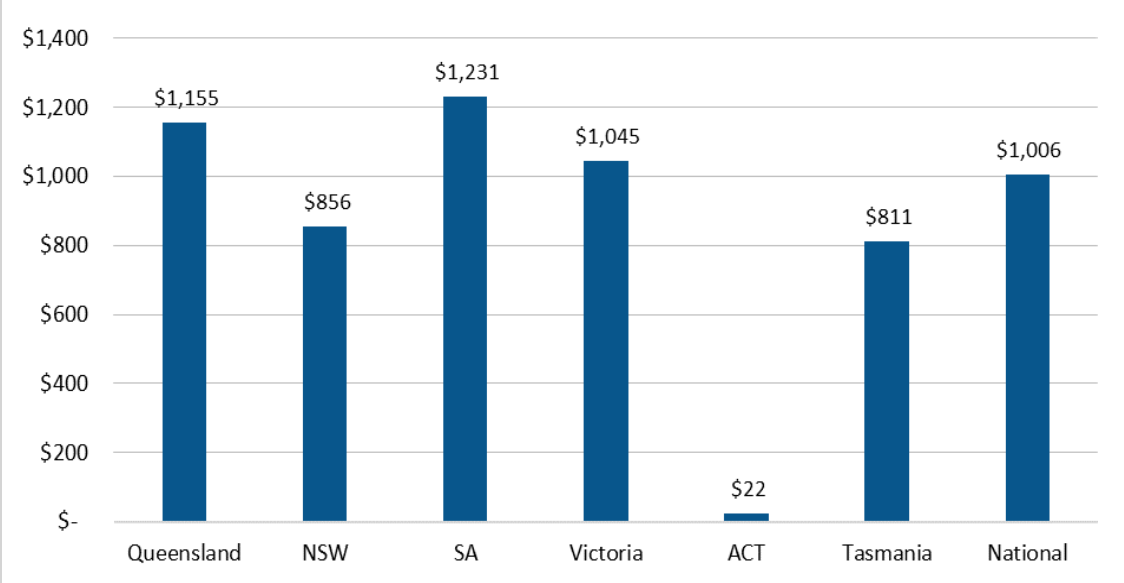
On a per customer basis, cumulative supernormal profits over the eight years are highest in Queensland, NSW and Victoria (Figure 9). The value for Victoria may be greater than indicated here because of the missing data for 2021.

[63] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[64] This excludes the possibility that some of TransGrid's excess returns are recovered from Evoenergy customers in the ACT.

Figure 8: Cumulative Network Supernormal Profits by Jurisdiction, 2014-2021 ($m real)

Source: AER data,[65] IEEFA analysis.

Figure 9: Cumulative Network Supernormal Profits per Customer by Jurisdiction, 2014-2021



Source: AER data,[66] IEEFA analysis.

[65] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[66] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The supernormal profit and average profit multiple by NSP are shown in Table 2. Of the 18 NSPs, 16 extracted supernormal profits over the period, affecting on average 89% of NEM customers over the period (approximately 9.3 million customers in 2021). Evoenergy and Essential Energy were the providers that did not extract supernormal profits due to negative or negligible supernormal profit amounts.

A total of 14 of 18 NSPs gained supernormal profits above IEEFA's expected profit multiple range upper bound of 1.3, affecting on average 86% of NEM customers over the period (approximately 9 million customers in 2021). Four providers, Evoenergy, Essential Energy, CitiPower and ElectraNet, had profit multiples below 1.3. See Section 5.4 for further discussion regarding the expected profit multiple range.

Table 2: Supernormal Profit and Average Profit Multiple (actual profit as multiple of normal profit) Over 2014-2021[67]

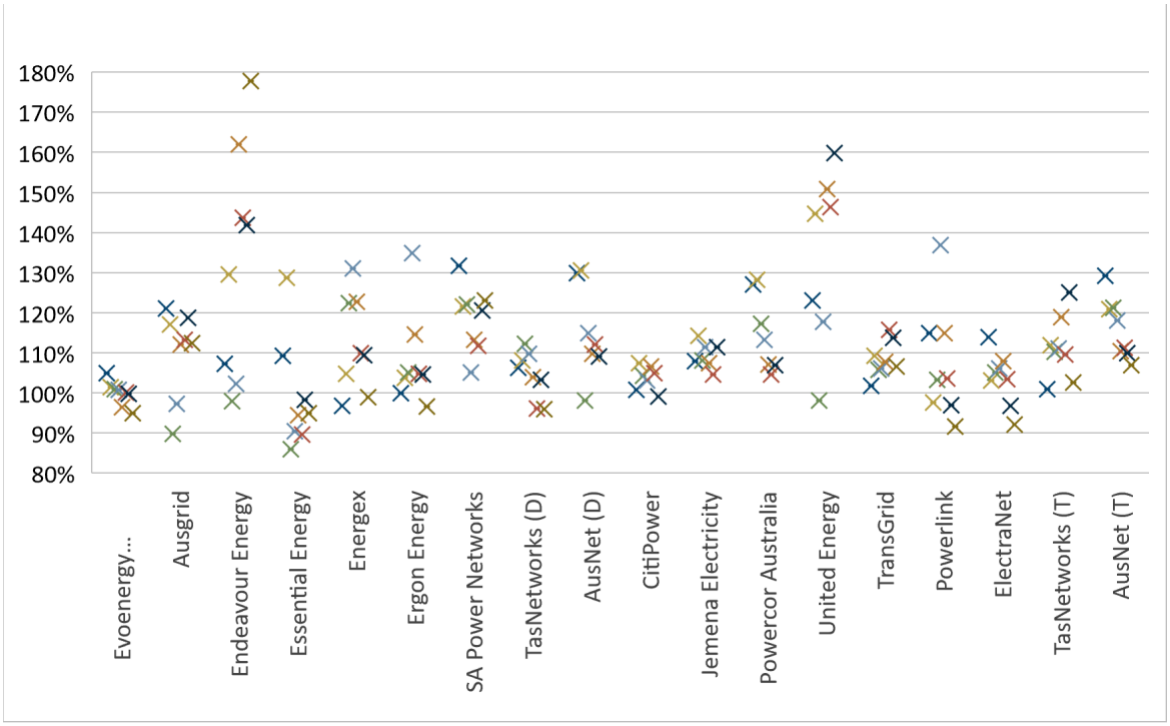
Network Service Provider	Supernormal Profit ($m)	Average Profit Multiple Over Period (actual profit as multiple of normal)
Evoenergy Distribution	$2	0.97
Ausgrid	$1,324	1.57
Endeavour	$1,510	2.83
Essential Energy	-$54	0.91
Energex	$1,195	1.63
Ergon Energy	$776	1.44
SA Power Networks	$1,002	2.62
TasNetworks (D)	$96	1.32
AusNet (D)	$629	2.04
CitiPower	$73	1.12
Jemena Electricity	$155	1.54
Powercor Australia	$554	1.78
United Energy	$701	2.68
TransGrid	$467	1.47
Powerlink	$488	1.33
ElectraNet	$78	1.17
TasNetworks (T)	$135	1.69
Ausnet (T)	$854	2.40
Total	**$9,984**	**1.70**

Source: AER data,[68] IEEFA analysis.
Note: For networks service providers that have related transmission and distribution networks, (T) marks the relevant transmission network and (D) marks the relevant distribution network.

[67] Note that the RROE data for 2021 are not available for four Victorian networks—CitiPower, Jemena Electricity, Powercor Australia and United Energy—so supernormal profit for 2021 is missing for those networks.
[68] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

Total network percentage revenues are compared with total network costs for each network and each year in Figure 10. This provides a view of supernormal profits relative to total costs for each network over the period.

Figure 10: Total Network Revenue as a Percentage of Total Cost, 2014-2021

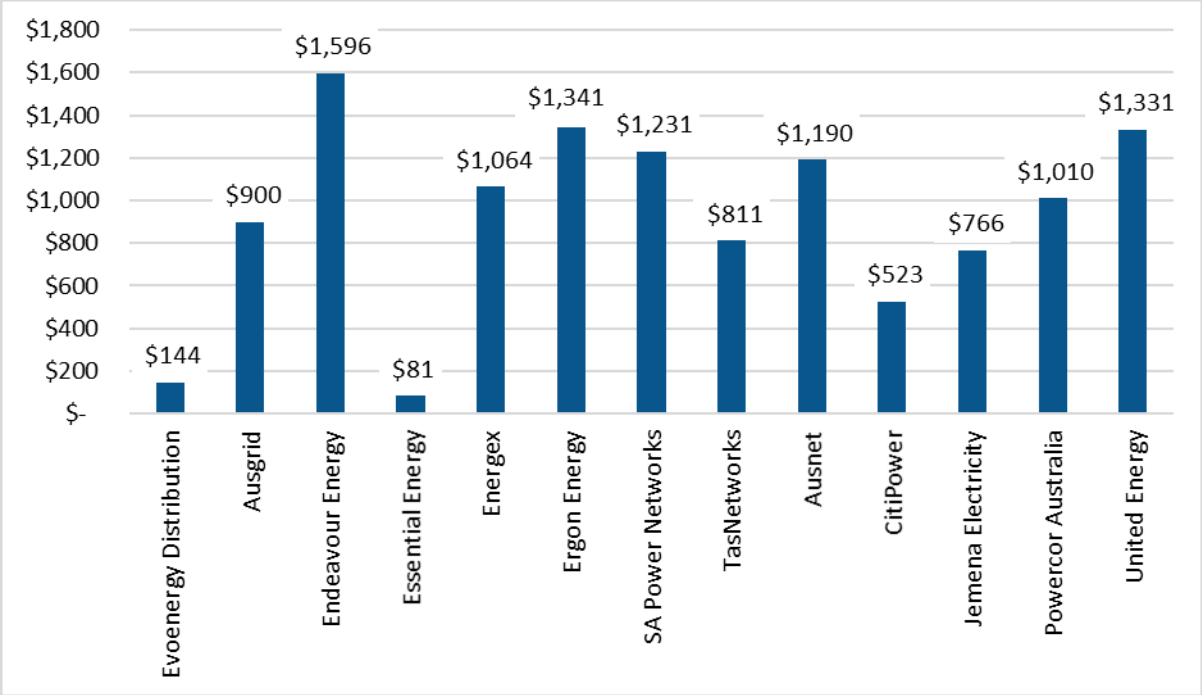


Source: AER data,[69] IEEFA analysis.

Cumulative supernormal profits per customer, combining transmission and distribution, are shown in Figure 11.

[69] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

Figure 11: Cumulative Supernormal Profits per Customer per Distribution Network (combined transmission and distribution), 2014-2021



Source: AER data,[70] IEEFA analysis—combining both transmission and distribution network supernormal profits for the 13 electricity distribution networks.

3.5 Gas Network Supernormal Profits?

The AER released limited gas network performance data in December 2021.[71] This relates to six gas distribution networks in NSW, ACT, Victoria and South Australia.

This gas network performance data includes return on assets (earnings before interest and tax or EBIT over the RAB) but not real return on equity (RROE, "allowed" or actual). The available return on assets data strongly suggests that actual RROE across the regulated gas network sector substantially exceeds the allowed RROE. This is because actual EBIT exceeds forecast EBIT by substantial margins. EBIT data do not include the impact of gearing, interest rates and tax, so it is impossible to measure supernormal profits.

The likely outcome for gas network economic regulation is not surprising since the rate of return methodology and inputs used for gas network economic regulation are very similar to those used in the electricity sector. It follows that gas retail prices are also likely to be significantly higher than they would be in the absence of supernormal profits.

[70] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[71] AER. Gas network performance report 2021. 22 December 2021. Page 66.

3.6 Supernormal Profit Trends Over the Period

There is significant inter-annual variation in supernormal profit amounts between the networks. The remittal of the NSW and ACT network decisions by the Australian Competition Tribunal[72] was one of the causes of this variation for the affected networks.

The electricity network supernormal profit data includes jurisdictional scheme effects and other revenue smoothing (the AER applies revenue smoothing to avoid price and revenue volatility from year to year). The duration of the data set represents a majority of two five-year revenue control periods. Revenue smoothing impacts, including jurisdictional scheme timing effects, are therefore largely neutralised over the entire period.

Results for 2020 and 2021 are likely to have been affected by COVID-19-related restrictions. Under revenue smoothing arrangements, it is possible that apparent reductions in supernormal profits may not persist.

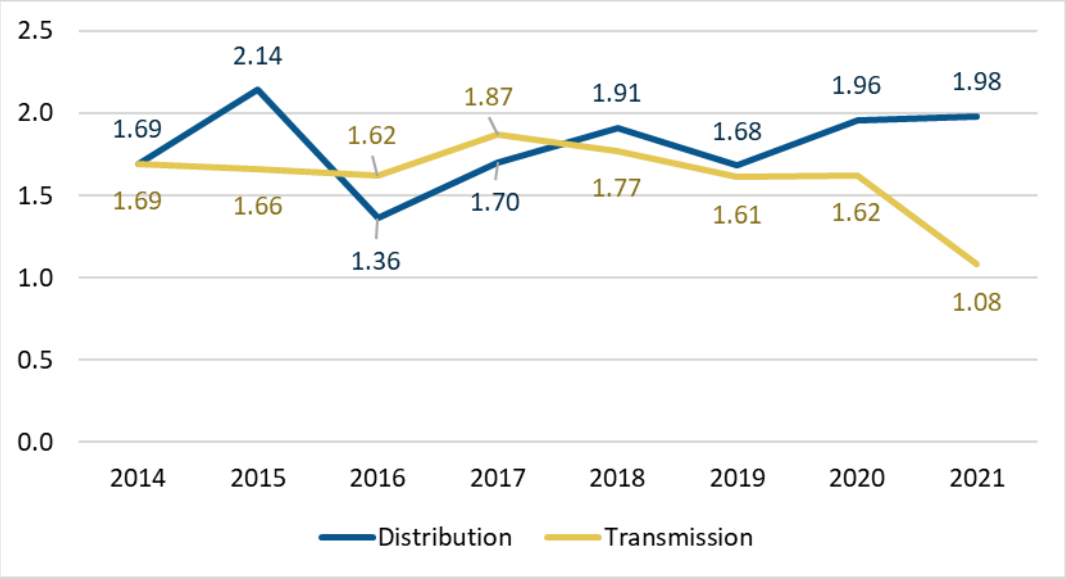
Interest rates declined over the entire period. The 2018 RORI began to take effect toward the end of the period.[73] The 2018 RORI reduced the target rate of return on equity from 7.25% to 6.36%, or a reduction of about 12.3%.[74]

The new RORI took effect gradually from 2020, as the earlier five-yearly regulatory decisions are replaced. So far, the 2018 RORI has applied to five DNSPs and one TNSP.[75]

Figure 12 shows the profit multiples across distribution and transmission networks, where the profit multiple is calculated by taking the actual profit as a multiple of the normal profit. As Figure 12 shows, the profit multiple of DNSPs has not decreased over the period, apart from 2016. There appears to be some reduction in TNSP multiples in 2021, but this does not represent a trend. There does not appear to be a trend of falling profit multiples since 2018, indicating that structural supernormal profits are continuing despite decreases in the allowed rate of return.

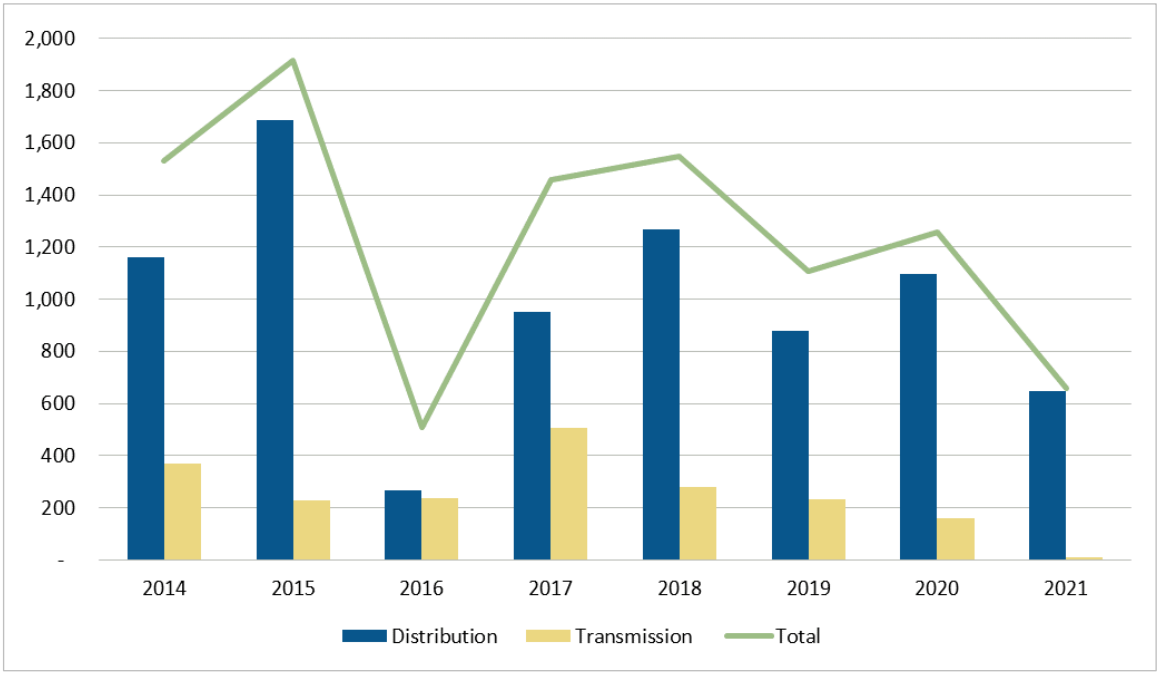
[72] Australian Competition Tribunal. Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1. 2016.
[73] AER. Rate of return instrument – Explanatory statement. 13 December 2018.
[74] AER. Rate of return instrument – Explanatory statement. 13 December 2018. Page 15.
[75] AER. Electricity network performance report 2022. 15 July 2022. Page 30.

Figure 12: Profit Multiples Across Distribution and Transmission Networks by Year (actual profit as multiple of normal profit), 2014-2021



Source: AER data,[76] IEEFA analysis.

Figure 13: Supernormal Profits by Year, 2014-2021 ($m real)



Source: AER data,[77] IEEFA analysis.

[76] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[77] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The year-by-year outcomes for distribution and transmission are summarised in Figure 13 above. The same data are presented in Table 3. This shows the contribution of transmission and distribution during each year toward the total supernormal profit of nearly $10 billion.

Table 3: Summary of Dollar Supernormal Profits by Year, 2014-2021 ($m real)

Supernormal profits (real $m ex incentives)	2014	2015	2016	2017	2018	2019	2020	2021	Total
Distribution	1,163	1,686	269	952	1,270	877	1,098	649	7,963
Transmission	369	230	239	507	279	231	158	9	2,021
Total	**1,531**	**1,915**	**508**	**1,458**	**1,548**	**1,108**	**1,256**	**658**	**9,984**

Source: AER data,[78] IEEFA analysis.

Profitability data for four distribution networks for 2021 are unavailable: CitiPower, Jemena Electricity, Powercor Australia and United Energy. Since these networks typically extracted supernormal profits for all other observations, it is possible they also extracted supernormal profits in 2021. The reduction in supernormal profits for transmission may reflect higher than forecast capital expenditure, the only time this occurred over the eight years. If capital expenditure returns to forecast levels, then it is possible transmission networks may extract supernormal profits in future.

3.7 Not All Supernormal Profits Are Measured

The RAB is the denominator for returns; hence the valuation of the RAB is a key driver of RROE. The aggregate value of electricity network RABs reported in 2021 was $100.4 billion.[79]

There is a further source of supernormal profits in addition to those quantified above. The AER analysis so far assumes that RABs are efficient.

Under the present NER, the RAB is rolled forward, meaning there are no asset write-downs. There is no optimisation for excess network capacity. However, under the National Electricity Code—the forerunner to the NER before the AEMC and AER were established—RABs were typically set by jurisdictional regulators using an Optimised Depreciated Replacement Cost (ODRC) method, which allowed for write-downs of excess capacity.

This change from the ODRC method to the RAB roll-forward method meant that the risk of excess capital investment was transferred from networks to consumers. Following the shift from ODRC to the roll-forward method, there was substantial

[78] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[79] AER. State of the Energy Market Report 2021. 2 July 2021. Page 148.

excess network investment resulting in unused network capacity across most of the NEM.

A review into network RABs in the 2018 ACCC Retail Electricity Pricing Inquiry found that RABs for networks in NSW, ACT and Queensland (both distribution and transmission) should be economically optimised (reduced/written down).[80]

It is also possible that RABs for private sector firms are also excessive. The 2018 ACCC Inquiry did not broach the topic of optimising the RABs of private firms. The AER acknowledged that "consumers will continue to pay for overinvestment in network assets from 2006 to 2013 for the remainder of the economic lives of those assets, which may be up to 50 years".[81]

Any excesses in current RABs are partly a product of historical excess returns, creating strong incentives to overinvest in capacity (so-called 'gold plating'). The introduction of new rules, including the capital expenditure sharing scheme, has substantially reduced the risks of future gold plating. However, they do not address any excess returns from inflated RAB values.

The dollar value of supernormal profits scales with the value of RAB. This means that returns from excess investment up to around 2015 are substantial but not measured at all in the new data released by the AER. **Actual supernormal profits are, therefore, substantially greater than those quantified in this report.**

3.8 Sensitivity of Estimates to Gearing Ratio Assumption

The assumed gearing ratio is the only additional assumption IEEFA has applied to derive the supernormal profit estimates discussed above. The sensitivity of supernormal profit to the gearing ratio assumption is tested in Table 4.

Table 4: Testing the Sensitivity of Profit Outcome to Gearing Ratio

Gearing ratio sensitivity (real $m)	60:40	61:39	59:41
Total network revenue	$102,745.5	$102,745.5	$102,745.5
Estimated total network cost	$92,761.2	$93,010.8	$92,511.6
Total net supernormal profit	$9,984.3	$9,734.7	$10,233.9
Revenue as a percentage of the total cost	110.8%	110.5%	111.1%

Source: AER data,[82] IEEFA analysis.

[80] Australian Competition and Consumer Commission. Restoring electricity affordability and Australia's competitive advantage Retail Electricity Pricing Inquiry—Final Report. June 2018.
[81] AER. State of the Energy Market Report 2021. 2 July 2021. Page 143.
[82] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The supernormal profit increases as the equity ratio increases (the gearing ratio decreases). For consistency, a gearing ratio of 40:60 is applied, as this is the ratio used by the AER in setting total network revenue. This avoids double counting the impact of reduced gearing on total network costs, as gearing is included in the AER's variance analysis.

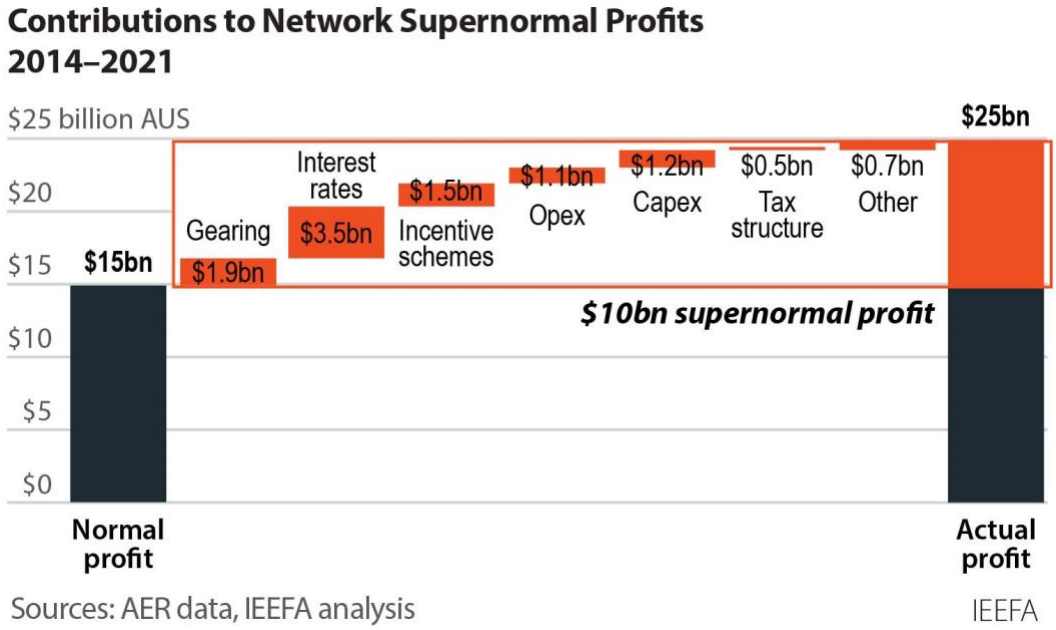
It appears that networks are operating at gearing ratios that vary from those originally used by the AER in setting the rate of return for networks. It is possible that the total dollar supernormal profit may be greater than estimated here because gearing is maximising supernormal profits.

4 How Did Electricity Network Supernormal Profits Happen?

4.1 Variances Between Revenue and Cost

Allowed network revenues exceeded actual costs over 2014-2021. Gaps between costs and revenues were not corrected over 80% of two five-yearly revenue control periods. Figure 14 identifies the sources of the variances between revenue and cost over the eight years, contributing to industry-wide above normal (supernormal) profits.

Figure 14: Incremental Contributions to Excess Returns on Regulated Equity



Source: AER data, IEEFA analysis. Derived from Figure 4.6 of AER. Electricity Network Performance Report 2022, p. 32

The supernormal profit components shown in Figure 14 are derived by converting each contribution to dollar values, using the percentage values in Figure 4.6 of the AER's 2022 electricity network performance report.[83]

Overestimated costs included gearing, interest rates, incentive schemes, opex, capex and tax among others. These cost overestimates mean that total revenue exceeded total cost and network shareholders received supernormal profits over the entire period and across the sector (with two notable exceptions).

[83] AER. Electricity network performance report July 2022. 15 July 2022.

The following section expands on how incentive schemes and the cost of financing (which affects interest rates in Figure 14) have contributed to supernormal profits. All cost components are further addressed in Section 5.

4.2 Incentive Schemes Have Contributed to Supernormal Profits

Incentive schemes are intended to mimic market outcomes whereby more efficient and innovative than average competitors can earn supernormal profits. The AER operates the following incentive schemes, which are currently under review:[84]

- efficiency benefit sharing scheme (EBSS)
- capital expenditure sharing scheme (CESS)
- service target performance incentive scheme (STPIS)
- demand management incentive scheme (DMIS) and demand management innovation allowance (DMIA)
- small-scale incentive scheme.

Some of these schemes take the form of rewards for avoided operating and other capital costs (CESS) or for efficiently reducing maximum demand (EBSS). They also seek to reward higher service standards (STPIS) and demand management (DMIS and DMIA).

Incentive schemes may help explain supernormal profits for individual NSPs. However, the AER's data shows that incentive schemes led to supernormal profits across regulated networks as an entire group, not just across high performing NSPs. Therefore, it appears that incentive schemes are rewarding average and possibly also below- average performance, contributing to sector-wide supernormal profits.

4.3 Interest Rates

The error in the estimation of debt financing costs represents 35.5% of cumulative supernormal profits—at 3.5 billion over 2014-2021. This error represents the combined impact of the selection of a benchmark credit rating at the lower end of creditworthy businesses and falling interest rates.

4.3.1 Debt Cost Estimates Do Not Reflect Debt Cost Data

It appears likely that debt markets may be applying lower risk premia to networks than estimated by the AER, resulting in an overestimation of the return on debt required for the portion of RABs financed by debt. This appears to be a key contributor to supernormal profits.

[84] AER. Review of incentive schemes for regulated networks. Date initiated 2 December 2021.

The benchmark credit rating for networks is currently BBB+ and the AER is proposing that this benchmark is retained in the 2022 RORI.[85] The BBB benchmark appears to place regulated networks in the bottom third of investment grade ratings.[86]

The network debt financing cost data is readily available, as networks report their actual financing costs in their regulatory information notice (RIN) responses. However, the AER does not use this data when determining the cost of debt finance that networks can charge back to consumers in the regulated revenue. There is no reference to actual debt financing cost data in the method for estimating debt financing costs under the 2018 RORI.[87] Similarly, the Draft 2022 RORI makes no reference to the contribution of lower interest costs to supernormal profits revealed in the AER's July 2022 network performance report.

Instead of using actual debt financing cost data from RIN returns, an index is constructed, labelled the Energy Infrastructure Credit Spread Index (EISCI).[88] The index is constructed by examining the debt financing cost for benchmark efficient entities. It uses a blend of A and BBB debt data from third-party debt providers and makes no reference to regulated network financing cost data.[89]

The benchmark efficient entities used to estimate networks' risk exposure in the index do not appear to enjoy similar protection from systematic risk. For example, there are no benchmark entities that consist solely of regulated network businesses. The benchmark entities typically engage in related businesses without the same level of revenue protection available for regulated network services.

This means that debt financing costs are likely to be structurally overestimated through the use of this index. The available evidence—that is, the AER data regarding NSPs interest rates costs explored in Section 4.1—suggests that actual costs are lower than estimated by the AER.

In various papers for the AER's 2022 rate of return review,[90] there is *no* reference to RROE data in discussions on whether the benchmark credit rating of BBB+ remains appropriate. The brief reference to RROE data is dismissed for the reasons discussed in Section 2.3 above and is not referenced as a crosscheck for the rate of return. There is no reference to the contribution of gearing to RROE outperformance in the section titled 'Updated empirical estimates' of the Explanatory Statement. Theory continues to prevail over evidence.

The AER is proposing to retain the ESCI, with some refinements, for the 2022 RORI.[91] There appears to be no checking as to whether actual debt financing costs

[85] AER. Draft 2022 Rate of Return Instrument – Explanatory Statement. 16 June 2022. Page 9.
[86] Rothschild. Corporate credit ratings: a quick guide. 2010.
[87] AER. Rate of return - Energy network debt data - Final working paper November 2020. Page 2.
[88] AER. Rate of return - Energy network debt data - Final working paper November 2020. Page 1.
[89] AER. Rate of return Energy network debt data Final working paper November 2020. Page 3.
[90] AER. Draft 2022 Rate of Return Instrument – Explanatory Statement. 16 June 2022. Page 19, 'Use of our industry debt index'; page 23, 'Crosschecks of the rate of return'; page 75, 'Updated empirical estimates'.
[91] AER. Rate of return - Energy network debt data - Final working paper

correspond to the AER's preferred option for refining the ESCI for the 2022 debt financing instrument.

4.3.2 Falling Financing Costs Do Not Explain Outcomes

The regulatory outcomes reported by the AER, including the lower-than-expected interest rate costs for NSPs, took place under a long-term fall in financing costs. This is indicated in the 10-year Australian Government bond yield data for 2014-2021, as summarised in Figure 15.

Figure 15: Yield on Commonwealth Government 10-Year Bond, 2014-2021

Source: RBA, Yieldbroker.[92]

A 2022 CEPA report suggests that the excess RROE can be attributed to the use of the trailing cost of debt to determine the allowed RROE under falling interest rates.[93] It does appear that AER decisions regarding the allowed rate of return appear to have lagged the decline in financing costs. This effect may also have been increased by prudent debt financing arrangements whereby the average forward duration of debt finance contracts may exceed the duration assumed by AER modelling.

With a possible future return to more normal rates of return, it is possible that supernormal profit attributable to falling financing costs (the interest rate block in Figure 14) will not continue. It appears, however, that falling interest rates are only part of the explanation for the error in the interest rates building block component—the other part of the error is accounted for by inaccurate debt

November 2020. Page 3.
[92] RBA, Yieldbroker. Capital Market Yields – Government Bonds. 2 August 2022.
[93] CEPA. EV/RAB Multiples AER. 10 May 2022.

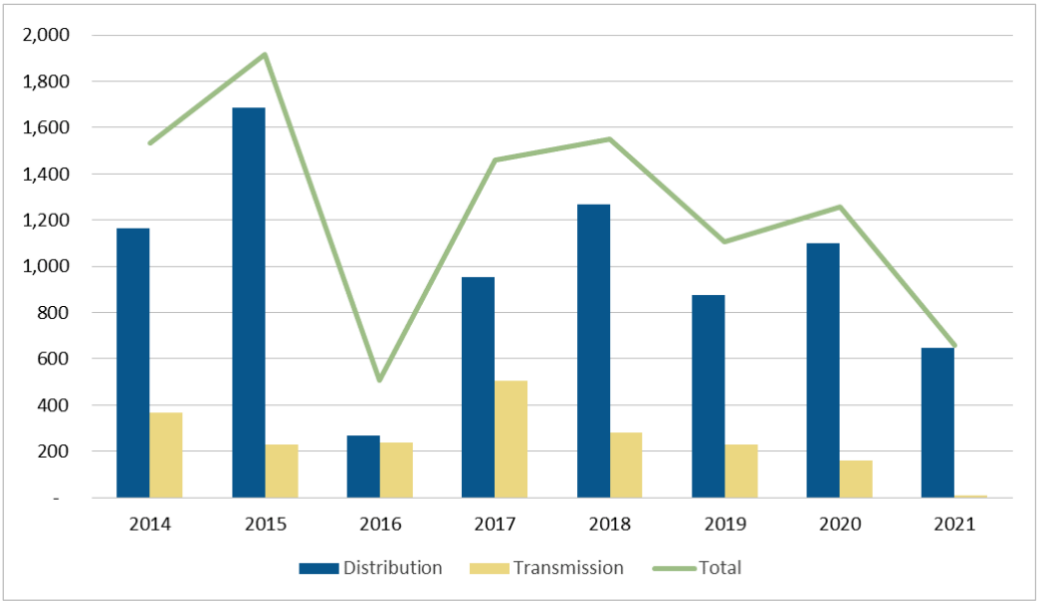
financing cost estimation. Therefore, as interest rates rise again, it cannot be assumed that the excessive cost associated with the interest rate building block will resolve itself.

4.4 The AER Attempt to Limit Supernormal Profits Was Mostly Overturned on Appeal

In the past, the AER attempted to limit supernormal network profits. This was, however, for the most part overturned following legal challenge by some networks.

The main inter-annual variation of supernormal profits over the period analysed in this report relates to the AER's 2015 determinations for NSW and ACT electricity and gas networks, in which the AER substantially reduced the allowed RROE. This appeared to follow recognition by the AER that supernormal profits across the sector were substantial in 2014 and 2015. Supernormal profits were then moderated in 2016, as seen in Figure 16.

Figure 16: Supernormal Profits by Year, 2014-2021 ($m real)



Source: AER data,[94] IEEFA analysis.

However, after the AER's 2015 determinations which saw significant reductions in profit and other cost allowances for networks, some affected networks sought a merits review of the final AER decisions (see Box 4 for details). Following the merits review by the Australian Competition Tribunal in February 2016[95] and confirmed by a Full Federal Court decision in May 2017, the AER was required to remake its remitted decisions.

[94] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[95] Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1. 2016.

The merits review outcome reflected the then prevailing rules. It constrained the AER's decision-making across the entire sector, not only for NSW and the ACT. This contributed to a return to sector-wide supernormal profits. The AER estimates that the Tribunal decisions added over $3 billion to network revenues.[96]

Box 4: Merits Review of AER Decisions for 2014-2019 Distribution Determinations for NSW and ACT (Electricity and Gas)

In 2015 four electricity and two gas networks sought merit review of the AER's final decisions for 2014-2019. The Public Interest Advisory Council also applied for a review of the AER's NSW final decisions. The Commonwealth Minister of Energy intervened in the proceedings as the Australian Competition Tribunal operates under the Competition and Consumer Act 2010.

The Australian Competition Tribunal handed down its decisions in February and January 2016. It remitted the decisions to the AER to be remade with respect to the methods used in the determination to estimate the return on debt, the value of imputation credits (gamma) and operating expenditure.

In March 2016, the AER sought judicial review of the Tribunal's decisions on gamma, return on debt and operating expenditure in the Full Federal Court. The Court upheld the AER's appeal with respect to the rules regarding gamma but dismissed the appeal in relation to the return on debt and operating expenditure.[v] Regarding estimating the cost of debt, the difference in the AER's method in its pre-remittal decision was $1.2 billion lower than that sought by the affected businesses.[vi]

In 2018, amendments to the national electricity and gas laws were made to provide for the binding rate of return instrument. Alongside the removal of limited merits review, this removed the opportunity for networks to seek limited merits review for previously non-binding rate of return decisions[vii] under section 44ZZMAA of the Competition and Consumer Act 2010.[viii]

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[v.] Federal Court of Australia. Australian Energy Regulator v Australian Competition Tribunal [2017].
[vi.] AER. AER re-examination of the determinations on debt for the NSW and ACT electricity distributors and for NSW gas distributor Jemena networks. December 2017.
[vii.] AER. Rate of Return Instrument - Explanatory Statement. December 2018.
[viii.] *Competition and Consumer Act 2010 (Cth)*, section 44ZZMAA.

The AER was unable to persuade first the Australian Competition Tribunal and then the Full Federal Court that the aspects of its determinations subject to merits review were necessary to avoid sustained supernormal profits.

[96] AER. State of the Energy Market 2021. 2 July 2021. Page 137.

The merits review judgments constrained the AER's ability to prevent supernormal profits. To the extent that supernormal profits are inconsistent with the NEL, then decisions by the Australian Competition Tribunal and the Full Federal Court were significant contributory factors.

It is possible these adverse merits review outcomes may not have taken place had network profitability data been published annually from 2014 to 2020, as provided for under the NEL. This data was not made public until September 2021.[97] In the absence of data, legal proceedings necessarily focused on theoretical debates about the estimation of the cost of capital and the AER's capital and operating benchmarking methodology.

The Australian Competition Tribunal merits review decision did not have the benefit of data showing that total network revenues exceeded total network costs by more than 10 per cent.

Profitability data would have provided clear evidence that networks were extracting excessive supernormal profits ahead of the contested AER determinations. This evidence could have lent support to the conclusion that the AER's determinations were sound and avoided some aspects of the merits review decisions requiring the remittal of the AER determinations.

[97] AER. Electricity network performance report 2021. 22 September 2021.

5 Why the Observed Supernormal Profits Are Not Justifiable Under the NEL

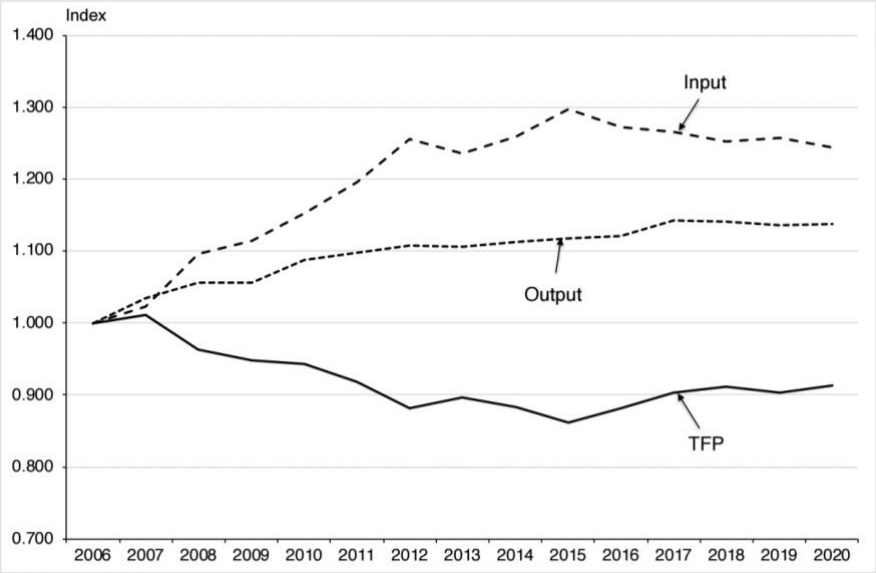
5.1 Supernormal Profits Do Not Appear to Reflect Higher Productivity

In some cases, perhaps where regulation and competition measures are not keeping pace with market and technology change, it is possible for most competitors to earn or extract supernormal profits. Alternatively, where productivity growth is very rapid, then 'information rents' may be significant during a transitional period. Under rapid innovation, expansion, rising productivity, widespread supernormal profits over an entire industry may occur for sustained periods and may be efficient rather than an expression of market power.

These types of conditions do not appear to apply to present Australian electricity networks. According to Economic Insights analysis[98, 99] commissioned by the AER, overall, NSPs have had flat or falling total productivity over 2014-2020, with some limited improvements.

Changes in network productivity since 2006 are summarised in Figures 17 and 18.

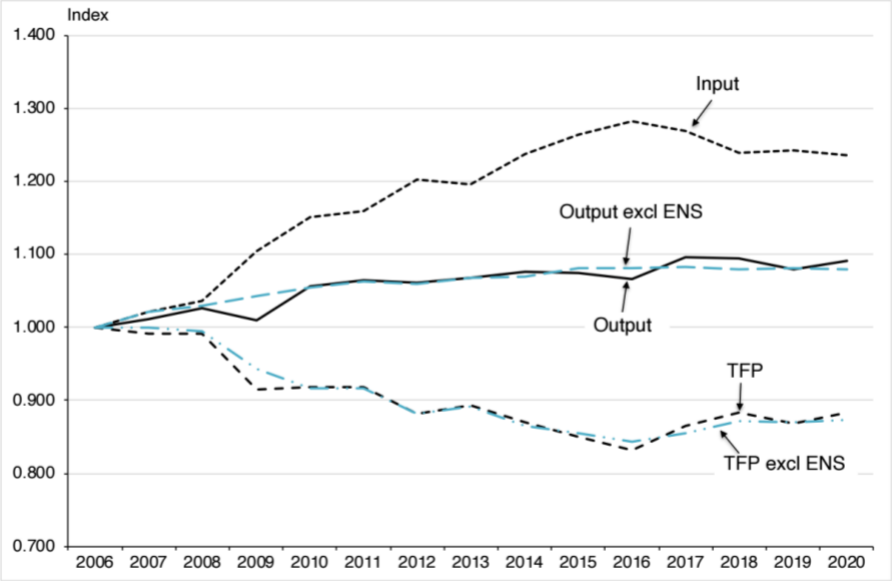
Figure 17: DNSP Industry Output, Input and Total Factor Productivity Indexes, 2006-2020



Source: Economic Insights.[100]

[98] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 DNSP Annual Benchmarking Report. 2021. Page 10.
[99] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 TNSP Annual Benchmarking Report. 2021.
[100] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 DNSP Annual Benchmarking Report. 2021

Figure 18: Transmission Industry Output, Input and Total Factor Productivity Indexes, 2006-2020



Source: Economic Insights.[101]

Both Figure 17 and Figure 18 provide a similar story. Overall sector productivity has improved since 2014 but remains well below the levels that applied when the current economic regulatory frameworks were first introduced.

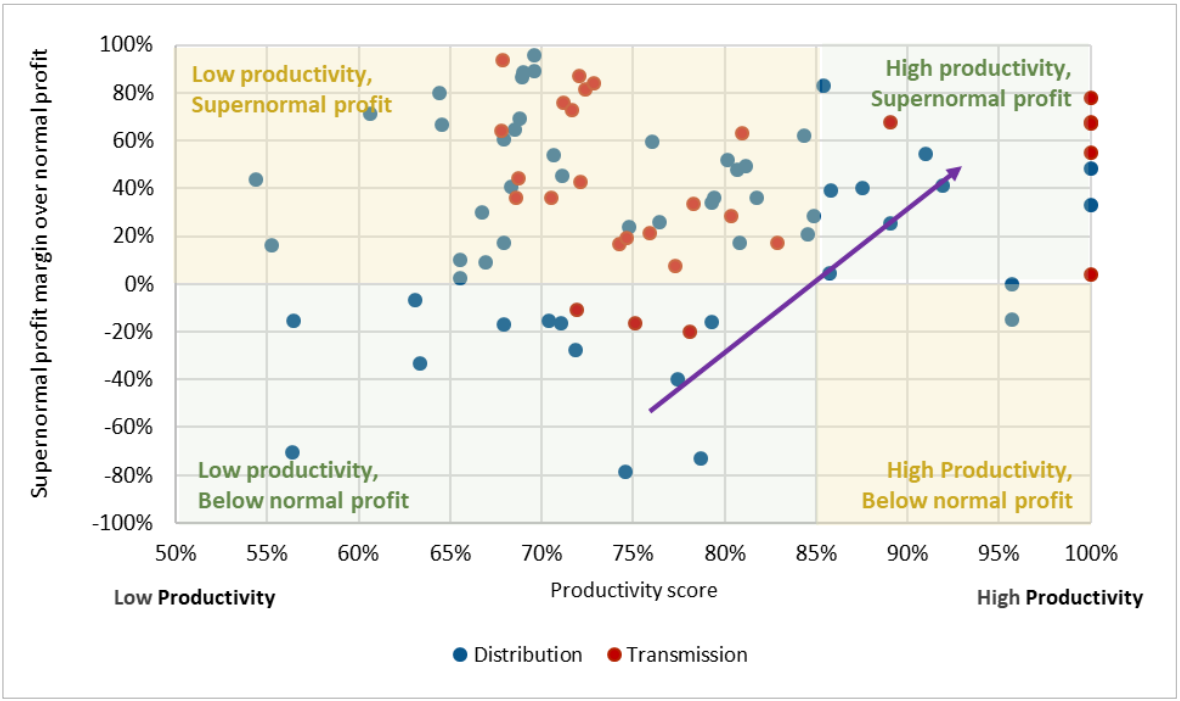
Figure 19 compares the supernormal profit margin discussed above with total productivity indices from 2014 to 2020. This uses a percentage margin (supernormal profit as a percentage of normal profit) in place of the profit multiples metric used elsewhere in this report, as it allows most data to be represented within a 100% bound on the vertical axis.

Under incentive regulation, there should be a discernible relationship between relative productivity (x-axis) and actual profit vs normal profit/loss (y-axis). There would be an association between higher productivity and above normal profits, on the one hand, and lower productivity and below normal profits and losses, on the other. The trend line for the data would broadly correspond to the purple arrow.

Over the 140 observations there is clearly no such discernible relationship. There is a substantial number of observations where above normal (supernormal) profits are extracted while relative productivity is lower than 80% of the most productive networks. As noted earlier, a clear majority of supernormal profit outcomes exceed the Biggar range.

[101] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 TNSP Annual Benchmarking Report. 2021.

Figure 19: Supernormal Profit Margin (Percentage) Over Normal Profit vs Relative Productivity Scores, 2014-2020



Source: Economic Insights data,[102, 103] AER data,[104] IEEFA analysis.

Figure 19 is derived from productivity data in Table 3.1 of the Economic Insights 2021 DNSP annual benchmarking report.[105, 106] This is normalised by defining the best performing distribution or transmission network at 100% for each year and measuring the percentage value of each observation relative to the best performing networks. This means that the relative scores are broadly comparable between transmission and distribution. The supernormal profit margin is as defined in the Glossary.

[102] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 DNSP Annual Benchmarking Report. 2021
[103] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 TNSP Annual Benchmarking Report. 2021.
[104] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.
[105] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 DNSP Annual Benchmarking Report. 2021
[106] Economic Insights. Economic benchmarking results for the Australian Energy Regulator's 2021 TNSP Annual Benchmarking Report. 2021.

5.2 *Interpretation of RAB Multiples in Transactions in Firms Owning NSPs*

The AER has explained the supernormal profits of NSPs, referring to a theory around information asymmetries applied to RAB multiples, as explored earlier in this report. Both the 2021 and 2022 AER network performance reports include a discussion on RAB multiples.[107, 108] In addition, in April 2022, the AER published a report it commissioned from CEPA on RAB multiples.[109]

RAB multiples are a measure of investor expectations about a network's future return and are widely used in market analysis of regulated utilities and in transactions. RAB multiples refer to the relationship between estimates of enterprise value (EV)—for example, as revealed in shareholding transactions—and RAB values.

EV reflects enterprise transaction values with various adjustments, including the market value of the existing debt portfolio. These transaction values can, in turn, be explained by and related to the future value of cashflows from regulated assets, discounted at the weighted average cost of capital.

If the allowances in the building block formula for a regulated company accurately reflect expected costs, then the allowed return on capital is equal to the cost of capital. It follows that EV will equal RAB. If the fundamental or market transaction EV to RAB multiple exceeds 1, this suggests that "investors anticipate that allowances for costs differ from actual costs, and/or that the allowed return on capital in future successive price controls is expected to be lower than the cost of capital required by investors for an investment with similar systematic risk".[110]

Both the 2021 and 2022 AER electricity network performance reports and the 2022 CEPA report refer to a 2018 paper by Dr Darryl Biggar, *Understanding the Role of RAB Multiples in Regulatory Processes*. Biggar states that seven conditions need to hold for the RAB multiple to be close to one, summarised below:[111]

1. *"The enterprise value of the regulated firm must reflect the present discounted value of the future stream of cash-flows*." The EV should not include other factors, such as a "premium for control" or other adjustments for an expected future increase in the RAB due to augmentation or replacement. The EV may include an expectation of future growth in the RAB due to capital expenditure exceeding depreciation and asset disposals.

2. *"The revenue and expenditure streams of the firm which is valued on the market must be the same as revenue and expenditure streams of the regulated*

[107] AER. Electricity network performance report 2021. 22 September 2021. Page 28.
[108] AER. Electricity network performance report 2022. 15 July 2022. Page 27.
[109] CEPA. EV/RAB Multiples AER. 10 May 2022.
[110] CEPA. EV/RAB Multiples AER. 10 May 2022. Page 4.
[111] Darryl Biggar. Understanding the role of RAB multiples in regulatory processes. 20 February 2018.

firm for which the RAB applies." The firms that own the regulated NSPs may generate revenues from assets outside RABs. This may increase or decrease EV relative to the EV that corresponds only to revenues generated from RABs.

3. *"The regulatory framework must use one of the standard forms of the building block model and must be expected to continue to do so into the future."* For example, this requires the use of a roll-forward method of valuing the RAB as opposed to alternative methods used before 2006, where the RAB value was subject to possible optimisation before each regulatory reset under Optimised Depreciated Replacement Cost (ODRC) and Optimised Deprival Value (ODV) methods.

4. *"The actual revenue received by the regulated firm must not systematically depart from the forecast regulatory revenue allowance."* This largely relates to volume uncertainty under price cap forms of control and is now less relevant following the shift to revenue cap regulation for all electricity NSPs.

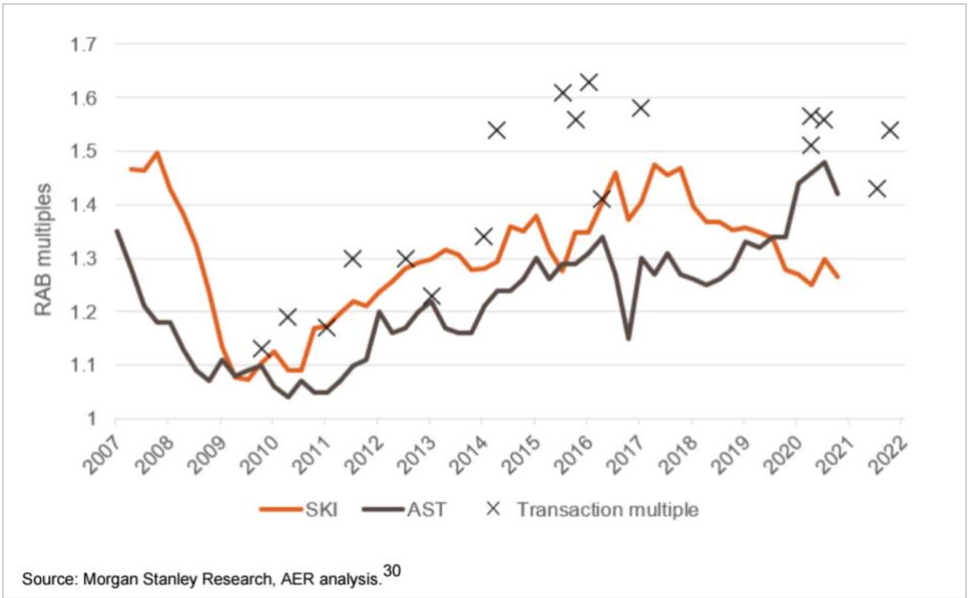
5. *"The forecast regulatory revenue allowance must not systematically depart from the actual expenditure of the regulated firm."* This refers to the link between the regulatory revenue allowance and the actual expenditure of the regulated firm. In an incentive-based regulatory system, EV estimates may assume that NSPs can exceed efficient expenditure benchmarks established by the regulator or generate additional value from incentive schemes for out-performance.

6. *"The forecast expenditure (and tax) building blocks must not systematically depart from the actual expenditure (and tax) incurred by the regulated firm."* For example, the RAB multiple may exceed 1 if the regulated firm is able to systematically forecast a high capital expenditure requirement and then underspend in practice. Another possible factor is the treatment of taxation—for example, the use of offshore tax havens or claiming interest payments in more than one country and changing the gearing ratio.

7. *"The regulatory cost of capital must not systematically depart from the regulated firm's actual cost of capital."* There are several reasons why the regulatory cost of capital might differ from the regulated entity's true cost of capital, reflecting a lack of data and uncertainty in methods used to estimate the weighted average cost of capital or the NSP entity. Variables include the systematic risk of a firm, use of a trailing average approach to estimate the cost of debt, use of long-term bonds to estimate the cost of debt, use of benchmark rather than actual gearing ratios and use of a benchmark rather than the actual value of imputation credits.

The Biggar and CEPA papers review significant evidence that RAB multiples for gas and electricity utilities in Australia exceed 1.[112] This highlights that the "ideal" conditions above do not appear to hold in practice.

Figure 20: AER Regulated NSPs — Transaction and Trading Multiples



Source: AER.[113]

Biggar suggests that, because of "information rents" in an optimal regulatory contract, excess profits (expressed as EV/RAB in the vicinity of 1.1) should be considered unobjectionable. He suggests that an error margin of plus or minus 20% on this figure could be considered a normal range.

Biggar suggests that an EV/RAB outside the range of 0.9-1.3 might give cause for further exploration and investigation.[114] The available EV/RAB data before and after the Biggar paper was released indicates that EV/RAB transaction values regularly exceed the proposed "Biggar range".

Similarly, the CEPA analysis finds that for EV/RAB observations and estimates for two NSP owning entities (Spark Infrastructure and Ausnet services), a significant portion of EV/RAB premiums cannot be explained by a set of five explanatory variables (encompassing some but not all the seven conditions in the Biggar paper). It identifies a significant "gap" between the EV/RAB ratio for those two NSPs, after a

[112] Darryl Biggar. Understanding the role of RAB multiples in regulatory processes. 20 February 2018. Page 9.
[113] AER. Electricity Network Performance Report July 2022. 15 July 2022.
[114] Darryl Biggar. Understanding the role of RAB multiples in regulatory processes. 20 February 2018. Page 11.

series of adjustments to discounted cashflows using RIN data, including to the cost of debt.[115]

The CEPA paper notes that, under an incentive based regulatory framework, investors have an opportunity to outperform regulatory expectations of expenditure and performance. It does not seek to draw conclusions on whether less than fully explained EV/RAB multiples at the top of the Biggar range could have implications for the 2022 review of the RORI.[116]

5.3 Limits of EV: RAB Evidence and Analysis So Far

A significant portion of network transactions and point-in-time EV estimates in the CEPA analysis appear to be well outside Biggar's proposed EV/RAB ratio range from 0.9:1 to 1.3:1. Similarly, the CEPA analysis was unable to explain its EV estimates on the basis of a set of five variables including the trailing average method for estimating debt financing costs. As discussed above, the AER and CEPA analyses so far do not examine the causes and persistence of the departures from the seven ideal conditions for a RAB multiple of 1 set out by Biggar.

The discussions in the Biggar and CEPA reports are also limited by the available transaction and EV estimation data. The discussions are not based on an assessment of outcomes across all regulated entities over multiple regulatory control periods. Outperformance outcomes that may appear reasonable for up to three or four NSPs at a point in time, or even over an extended period, may not be reasonable when considered across the entire sector and over eight years—80% of two regulatory control periods.

Similarly, the discussion on RAB multiples does not identify the scale of wealth transfers from consumers to equity holders—approaching $10 billion, and associated retail bill impacts. In isolation, the EV/RAB multiple does not shed light on whether outcomes are consistent with the AER's stated objective of ensuring prices are no more than necessary to ensure the safe and reliable supply of network services.

Moreover, the reports do not appear to address the fact the entire EV/RAB multiple greater than 1 is allocated to shareholders (equity) in the form of higher than normal profit, inclusive of all regulated capital expenditure and compensation for estimated systematic risk. Given the concentration of the supernormal profits to equity holders, the AER has not established the basis for using RABs as the denominator for identifying the range of acceptable outcomes under incentive regulation.

5.4 A Better Metric for Assessing Regulatory Outcomes

The AER's explanation for supernormal profits, based on EV/RAB multiples, does not withstand closer scrutiny. Considering sector-wide outcomes over a majority of two regulatory control periods, alongside the factors that resulted in persistent

[115] CEPA. EV/RAB Multiples AER. 10 May 2022. Page 20.
[116] CEPA. EV/RAB Multiples AER. 10 May 2022. Page 6.

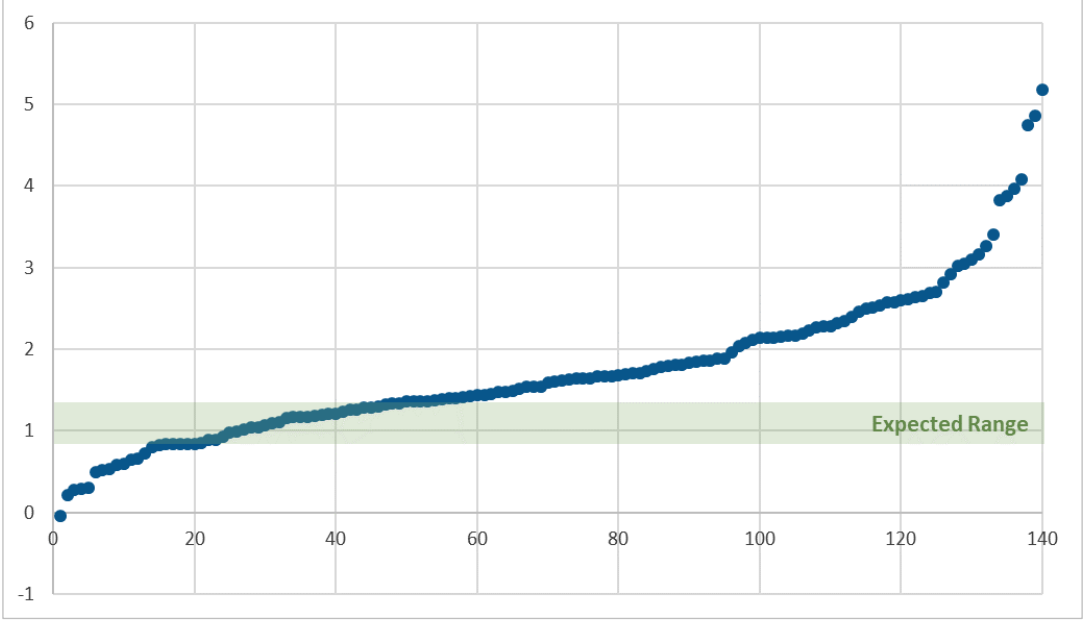
normal profits, consumers have clearly been paying substantially more than necessary for safe and reliable regulated energy network services.

In IEEFA's view, a better metric for assessing regulatory outcomes under the NEL and National Electricity Objective is to compare the distribution of actual profit as a multiple of normal profit over the entire sector for an extended period (in this case, eight years and 80% of two regulatory control periods for each NSP). A key advantage of the profit multiples metric is that it recognises the concentration of supernormal profits to a single sub-component of the return on capital cost building block— compensation for the systematic risk of the contribution of equity to financing RABs. That is, any errors in the building block methodology that increase revenue to networks above their costs then flow entirely to equity shareholders.

The Biggar reasonable RAB:EV ratio of 0.9:1 to 1.3:1 could be applied to the actual profit as a multiple of normal profit. This would provide a benchmark for assessing the expected range of network profits under the revenue and pricing principles and Objective 3 in the AER's Strategic Plan 2020-2025.[117]

The distribution of actual profit as a multiple of normal profit for each network each year is shown in the Figure 21. The green area indicates the expected range under effective incentive regulation. It recognises the possibility of systematic information advantages by setting the midpoint at a multiple of 1:1.1. Not all outcomes would necessarily fall within this expected range—it is likely that, for example, 20% of outcomes could fall above or below this range for a variety of reasons.

Figure 21: Actual Profit as a Multiple of Normal Profit, 2014-2021



Source: AER data,[118] IEEFA analysis.

[117] AER. AER Strategic Plan 2020-2025. 2020.
[118] AER. Electricity network performance report 2022: Financial performance data 2022-Electricity networks. 15 July 2022.

The results highlight that outcomes over 2014-2021 are heavily asymmetrical in favour of networks. The midpoint of the simple average is a multiple of 1:1.7, which is more than 50% higher than the 1:1.1 midpoint suggested by Biggar for RAB multiples. Only a third of outcomes are within the 0.9 to 1.3 multiple range, with the remaining two-thirds of outcomes exceeding a 1:1.3 ceiling threshold. This compares with perhaps 10% of outcomes being above the expected level under effective incentive regulation.

The revenue and pricing principles in the NEL refer to allowing "a return commensurate with the regulatory and commercial risks involved in providing the direct control services to which that price or charge relates".[119] None of the analyses referred to by the AER so far provides a reason for rejecting the use of supernormal profit multiples to assess whether NSP regulation is effective in constraining the monopoly pricing power of NSPs.

The discussion of RAB multiples so far does not explain how compensating equity holders an average of 1.7 times normal profits is consistent with the relevant part of the NEL (revenue and pricing principles).

5.5 Are Outcomes Consistent With the AER's Stated Objective?

Drawing on the earlier analysis of the causes and size of supernormal profits, this section discusses whether observed outcomes can be reconciled with Objective 3 in the AER's Strategic Plan 2020-2025 that "consumers pay no more than necessary for the safe delivery of reliable electricity and gas network services".[120] Alongside the discussion in Section 6 on efficiency impacts, it also seeks to assess whether supernormal profit outcomes are consistent with the National Electricity Objective.

Returning to the Biggar conditions, we can now assess which of the seven conditions for EV/RAB ratio of 1 apply to the network profitability data. This is summarised in the Table 5.

[119] South Australian Government. *National Electricity (South Australia) Act 1996*, section 7A(5).
[120] AER. AER Strategic Plan 2020-2025. 2020.

Table 5: Summary of AER RROE Data Compared With Biggar Conditions for EV/RAB Multiples Around 1:1

	Biggar's "ideal" conditions	Has the condition been met?
1	No premia/discount for control etc.	**Yes**. Profitability data do not include premia or discounts for control and other variables. They also incorporate changes in the RAB where there have been high levels of capital investment within the eight years.
2	EV = RAB	**Yes**. Profitability data relate only to direct control services—EV is generated solely from RABs and not from other assets.
3	RAB roll-forward	**Yes**. Profitability data are not affected by variations in RAB valuations since RAB roll-forward has replaced ODV and ODRC.
4	Revenue cap	**Partly**. Price cap regulation applied to Victoria and South Australia DNSPs for most of the period 2014-2020, but revenue cap applied to all other entities.
5	Revenue = expenditure	**No**. The link has been broken, not only due to incentive schemes but also other expenditure overestimations.
6	Forecast expenditure = actual expenditure	**No**. Actual expenditure appears significantly lower than allowed expenditure.
7	Allowed cost of capital = actual cost of capital	**No**. The cost of debt has been significantly lower than the allowed cost of debt. The gearing ratios and other variables are also factors.

"Ideal" conditions 5-7 have not been met, and condition 4 has been partly met for certain DNSPs operating under a price cap form of regulation during 2014-2021. We can now return to the variance analysis in Section 4 to 'peel away' the sources of supernormal profits and assess the effectiveness of NSP economic regulation.

5.5.1 Gearing (condition 7)

Using a standardised gearing assumption for all NSPs may be reasonable in the absence of supernormal profits. The gearing contribution may reflect NSP decisions to maximise the supernormal profits from the other variables. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector-wide supernormal profits over the period 2014 to September 2021, the contribution of gearing appears higher than necessary under effective incentive regulation.

5.5.2 Interest Rates (condition 7)

It is likely that falling interest rates only partly explain the contribution of debt costs to supernormal profits over the period and the use of the trailing average cost of debt to estimate forward debt costs. A significant part of the explanation is related to the use of a benchmark credit rating (EISCI) instead of actual credit ratings and associated actual debt costs. The selection of the benchmark credit rating in the bottom third of investment grade ratings appears to reflect an underestimation of the extent systematic risks were transferred to consumers. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector-wide supernormal profits over the period 2104 to September 2021, the contribution from lower debt costs appears higher than necessary under effective incentive regulation.

5.5.3 Incentive Schemes (condition 5)

Supernormal profits from incentive schemes appear to be unrelated to productivity or efficiency. As discussed in Section 4, it appears that incentive schemes are rewarding average and even less than average performance. The AER is currently reviewing and refining its incentive schemes. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector-wide supernormal profits over the period 2104 to September 2021, the contribution of incentive schemes to sector-wide supernormal profits appears higher than necessary.

5.5.4 Opex (condition 6)

In 2017, the AER commissioned an independent review of an aspect of the method used to benchmark efficient operating and maintenance expenditure—operating environment factors (OEFs). Among other things, the review found that substantial changes to the methodology were required, including the estimation of efficient vegetation management, which is the largest component of sector-wide opex.[121] The report also noted that the AER applies a "conservative" approach to estimating "immaterial" OEFs.[122] Differences in vegetation opex between networks are substantial. As a result, estimates of this variable are the biggest single influence on the comparison point used to estimate total efficient opex for each network. AER uses inaccurate inputs for the estimation of efficient vegetation opex. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector supernormal profits over the period 2104 to September 2021, the contribution of lower than forecast operating and maintenance expenditure appears greater than necessary under effective incentive regulation.

[121] S. Orme et al. Independent review of Operating Environment Factors used to adjust efficient operating expenditure for economic benchmarking. Australian Energy Regulator. August 2018.
[122] AER. Final Decision, Ausgrid Distribution Determination 2015-16 to 2018-19. Attachment 7 – operating expenditure. April 2015. Page 180.

5.5.5 Capex (condition 6)

For the purpose of assessing network profitability data, variances between actual and forecast capex are reflected fully in the data and therefore condition 1 does not apply to capex as it would in a point in time EV/RAB estimate. As shown in the AER's 2021 network performance report,[123] total capital expenditure over the 2014-2020 period underspent allowances for five out of the seven years—contributing to supernormal profits. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector-wide supernormal profits over the period 2104 to September 2021, the contribution from lower than forecast capital expenditure appears greater than necessary under effective incentive regulation.

5.5.6 Tax (condition 6)

The AER identified problems with its benchmark methods for estimating tax in a 2018 review,[124] drawing on data provided by the Australian Tax Office. This identified that privately owned NSPs typically paid lower than benchmark taxes while publicly owned NSPs paid more than benchmark taxes under State and Territory tax equivalent regimes. This suggests that the sector-wide impact estimated here may obscure significant contributions to supernormal profits for privately and part-privately owned NSPs. The AER subsequently made certain changes to its building block methodology. This included moving to use the opening RAB to set the return on capital in place of the previous arrangement that sought to incorporate the timing of capital expenditure. To the extent the AER, and other observers, including the Australian Competition Tribunal and consumer representatives, were not aware of the scale and persistence of sector-wide supernormal profits over the period 2014 to 2018, the contribution from lower than forecast tax expenditure appears greater than necessary under effective incentive regulation.

5.6 Economic Regulation of Energy Networks Is Not Effective

The AER's reliance on limited analysis and discussion of RAB multiples to explain variances between actual and allowed profits, does not withstand closer scrutiny. Considering sector-wide outcomes over a majority of two regulatory control periods, alongside the factors that resulted in persistent normal profits, consumers have clearly been paying substantially more than necessary for safe and reliable regulated energy network services.

Network regulation has failed to ensure that consumers pay no more than necessary for safe and reliable network services.

[123] AER. Electricity network performance report 2021. 22 September 2021.
[124] AER. Final report: Review of regulatory tax approach. December 2018.

These supernormal profits cannot be explained by higher-than-expected performance improvements. Consumers are being charged for NSP "costs" that do not exist. The available data for gas networks strongly indicates that supernormal profits are also occurring in regulated gas networks regulation. There is an ongoing wealth transfer from Australian energy consumers to the owners of Australia's energy networks, including overseas owners.

Economic regulation of electricity (and gas) networks in most of Australia over the period 2014-2021 has therefore consistently failed to prevent networks from setting prices well above their total costs and generating sustained and substantial supernormal profits. This outcome is clearly not consistent with any reasonable interpretation of the requirement under the National Electricity Objective:

> *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, safety and reliability and security of supply of electricity*.[125]

As will be discussed in Section 6, the structural and persistent supernormal profits are inefficient and unfair and not in the long-term interests of consumers and in IEEFA's view, do not appear consistent with the NEL revenue and pricing principles. Bloated profits are increasing costs and delaying the investment necessary for the energy transformation.

Section 7 then discusses the factors that have driven monopoly electricity network regulation to failure, and Section 8 outlines how to repair the regulation of networks to prevent supernormal profits from occurring.

[125] AEMC. National Energy Objectives.

6 What Are the Impacts of Excessive Supernormal Profits for the Energy Transformation?

Ineffective network regulation poses a substantial risk to the energy transformation—both for regulated and non-regulated transmission and distribution. Fast and effective action is required to avoid excessive supernormal profits. This section reviews the impacts of excessive supernormal profits on the energy transformation.

6.1 Efficiency and Equity

Excessive supernormal profits mean that overall electricity prices are currently higher than necessary. Higher prices inefficiently suppress demand for network services and encourage higher than efficient investment in non-network alternatives, including consumer energy resources. High network prices have already contributed to widespread underutilisation of existing network capacity and excess network capacity. This, in turn, has adversely affected the overall productivity of the sector.

Higher prices inefficiently suppress demand for network services and encourage higher than efficient investment in non-network alternatives.

Supernormal profits transfer wealth and result in deadweight losses, reducing gross domestic product and the international competitiveness of Australian exports and import substitutes. Supernormal profits may lead to consumers investing in substitute assets and services at higher levels than otherwise, reducing the utilisation of network assets. As a result, supernormal profits reduce dynamic efficiency or economic efficiency over the long run.

Supernormal profits are not being reinvested in higher levels of regulated capital investment. They are instead being retained by shareholders, including in the form of dividends.

Electricity networks in Tasmania and Queensland remain in government ownership. This means supernormal profits are, in effect, returned to taxpayers. Fund managers such as Spark Infrastructure and Hastings also have substantial equity in the sector.

Ownership of privatised networks in NSW, Victoria and South Australia is concentrated among relatively few entities. Parent entities outside Australia now hold a large and increasing proportion of equity in regulated networks. These entities include Hong Kong's Cheung Kong Infrastructure Holdings Group and Power Assets Holdings, Singapore Power International and State Grid Corporation of

China.[126] This suggests that a significant portion of supernormal profits from electricity networks are leaving Australia and unavailable for domestic investment in the energy transformation.

6.2 Implications for Decarbonisation and Establishment of the RNC

As noted earlier, no concerted program of actions is currently underway to constrain supernormal profits. If supernormal profits are allowed to persist, then they will double the network bill impact of all incremental regulated network capital expenditure to support the energy transformation.

This is shown in a simple hypothetical example summarised in Table 6. In this example, there is an asset with 100 units with an equity financing of 40% and a 50-year depreciation period. There are two RROEs of 4.95% being the AER's estimate of the efficient average RROE (allowed return) over 2014-2021 and 9.15% being the actual RROE over 2014-2021 (actual return).

Table 6: Inputs for Asset Lifetime Financing Cost Estimate — Worked Example

Item	Parameter
Capital cost of asset	$10.00
Equity financing	$4.00
Asset life	50
Annual depreciation	2%
Allowed RROE (allowed return)	4.95%
Actual RROE (actual return)	9.15%

Source: IEEFA – example calculations.

Table 7 shows the impact of supernormal profits over the asset's life. Under the efficient RROE, the lifetime RROE is 50.5% of the asset's capital value, compared with 93.3% of the capital value with the excess if the supernormal profits for 2014-2021 were allowed to continue for the lifetime of the asset. In this simple example, the return on debt is ignored, as it is assumed to be the same in either case. However, including the return on debt, the total financing costs would exceed the capital cost by a substantial margin.

[126] AER. State of the Energy Market 2021. 2 July 2021. Page 131.

Table 7: Impact of Excess Returns Over Asset Life — Worked Example

Item	Parameter
Lifetime RROE $m (normal profit)	$5.5
Lifetime RROE $m (actual profit)	$9.3
Difference (supernormal profit)	$4.3
Efficient RROE as % of asset	50.5%
Excess returns RROE as % of asset	93.3%
Percentage difference	42.8%

Source: IEEFA – example calculations.

This example shows that if the total capital cost of new regulated network assets to support the decarbonisation of Australia's energy sector were $10 billion, and the historical network economic regulation outcomes from 2014-2021 were applied to this investment, then the actual profit received by shareholders would be $9.3 billion, $4.3 billion more than what was required to provide a normal profit to shareholders. The cost of equity funded by consumers for the life of the assets would be $9.3 billion instead of $5.5 billion. The $4.3 billion excess received by shareholders would be a supernormal profit.

This means that if the supernormal profit issue is not rectified, the shareholder profit on future network investments, funded by consumers, could be 85% higher than required.

There is a significant risk that current estimates of network investment capital costs necessary to support the energy transformation will be subject to cost escalation for various reasons.[127]

6.3 Risk to Non-regulated Transmission Investment

It is possible supernormal profits contribute to underinvestment and delays in non-regulated transmission. The energy transformation requires substantial new investment in non-regulated transmission. This refers to transmission required to connect new renewable generation to regulated transmission networks.

This includes most, if not all, the new transmission within renewable energy zones. Compared with traditional generation where 3GW of capacity is at a single location, with a single transmission connection to the regulated network, a 3GW renewable energy zone is geographically dispersed and requires a substantially larger transmission investment. Related to this, it is typically more efficient for several generators within a renewable energy zone to share an internal transmission "ring" connecting multiple generators to a single large connection to the regulated transmission system.

[127] See, for example: Ted Woodley and Simon Bartlett. The Australian. Pull the plug on costly powerline schedule. 30 August 2022.

Non-regulated transmission investment is notionally contestable, meaning open to competition. Under jurisdictional arrangements, there may be only a single licensed transmission entity. Planning privileges attached to a single transmission operator in a given jurisdiction may also limit entry and real contestability.

Non-regulated transmission is funded through capital contributions and/or ongoing network charges from generators. These charges and contributions must then be recovered from generator revenue from wholesale and financial markets.

Generation connection transmission assets are not subject to direct economic regulation by the AER.[128] Where the assets are transferred to be managed within regulated networks, they enter RABs at zero value, and no depreciation or contribution to profits are provided for. Similarly, operating expenditure may be ring-fenced from regulated operating expenditure.

Financing non-regulated transmission is higher risk than regulated transmission. This is because it is not directly recoverable from monopoly charges added to consumer bills.

Transmission entities appear to be reluctant to finance non-regulated transmission. For example, from the available public information, it appears there has been no significant investment in non-regulated transmission unless it has been financed by the connecting generators. This appears to reflect an unwillingness of transmission shareholders to allocate capital to non-regulated transmission.

This reluctance to invest without guaranteed regulated returns is also confirmed by the fact that jurisdictions have entered underwriting arrangements with regulated transmission entities to undertake "early" works capital expenditure on proposed regulated transmission augmentation. This expenditure precedes the outcome of the regulatory investment test, which, if successful, permits the regulated recovery of this investment. Without these underwriting arrangements, capital expenditure would not have taken place until after the regulatory investment test.[129]

This reluctance appears to be explained in part by supernormal profits extracted by regulated transmission networks. Normal profits from non-regulated transmission are substantially inferior to supernormal profits from regulated transmission.

Where contestability is limited, this creates opportunities for non-regulated networks to apply higher capital or financing costs to non-regulated transmission investment. If so, this would deter and delay generation investment.

[128] Although they may be subject to a form of quasi regulation as in NSW.
[129] Transgrid. Federal funding of $75 million to secure supply and assess energy sharing options between NSW and Victoria. 7 April 2022.

6.4 Distortion of Emergent Contestable Markets for Community Batteries and Standalone Power Systems

At the distribution level, decisions are being made regarding the boundary between regulated and non-regulated services. Notable examples include community batteries and standalone power systems.

The AER has modified its ring-fencing guideline to increase the opportunity for regulated networks to provide energy transformation services, including community batteries and standalone power systems.[130]

Decisions to allow regulated entities to enter contestable markets for storage and standalone power systems appear to rest on the assumption that network regulation is effective in constraining network pricing. However, since this assumption is clearly false, the participation of regulated networks in contestable markets could offer networks unfair advantages. This could distort market outcomes in favour of regulated networks. This may not be in the long-term interests of consumers.

6.5 Risk to Energy Transformation Regulated Capital Costs

Electricity networks have limited incentives to constrain capital costs, where the risk of excess investment lies with consumers rather than below normal profits.

Recent increases in retail electricity prices are being driven by rising gas, coal and wholesale electricity prices. Retail electricity price rises could be reduced if excessive network returns could be prevented.

If network economic regulation is ineffective, then the economic and social cost of decarbonisation of Australia's economy will be far higher than it needs to be. Investors in renewable generation will continue to be cautious about the rate and cost of new transmission investment.

Consumers will face excessive costs that may make them less supportive of necessary new investments. This then creates a strong temptation to delay or slow the rate at which the country reduces emissions.

There is an opportunity for governments to fix these historical failures so that decarbonisation does not result in higher costs and prices in the long run and trade-exposed sectors improve their competitiveness. There is an opportunity to reduce upward pressure on retail bills, due to increases in coal and gas prices, by improving the governance of economic regulation of electricity and gas networks.

[130] AER. AER Electricity Ring-fencing guideline: Explanatory Statement - version 3. November 2021.

These changes would stop supernormal profits to shareholders in electricity and gas networks that divert revenue for, and investment in, zero emissions generation. This requires the Australian Energy Regulator to change its current methods and processes for regulating actual network returns.

As for supernormal profits, there is a systematic problem where regulated electricity network capital expenditure is higher than it should be. There is also an opportunity for the new government to use the RNC to ensure that the capital costs of new transmission investment are not excessive and are timelier. The RNC needs to avoid a continuation of wealth transfers from consumers to networks that inhibit new generation investment.

7 Why Has Monopoly Network Economic Regulation Failed?

7.1 A Failed Regulatory System

The failure to constrain networks from extracting persistent excessive supernormal profits is caused by defects in the regulatory system for both electricity and gas networks. A key part of the problem here is that the AER has failed to develop and report on quantitative measures that would objectively assess how it is performing against Objective 3 of its Strategic Plan 2020-2025 of "ensuring that consumers pay no more than necessary for safe and reliable electricity".[131]

The AER is governed under State and Territory law. The NEL is jurisdictional, not Commonwealth. However, it appears there are no provisions for jurisdictional Ministers or, indeed, Parliaments and their Auditors- General to evaluate the performance of the AER.

Auditors-General typically advise Parliament on the performance of jurisdictional legislation and have previously reported on electricity network decisions it considers problematic. For example, in a 2018 report, the NSW Auditor-General criticised the process for the partial sale of Ausgrid.[132]

Instead, Commonwealth Ministers are responsible for the performance of the AER, as the AER is effectively a Commonwealth entity from a funding and operational governance perspective. It operates within the ACCC under the *Public Governance and Accountability Act 2013* (Cth).[133]

The Ministers responsible for governing the AER do not appear to have checked the AER's performance against its stated objective that consumers pay no more than necessary for safe and reliable electricity. They did not require the AER to report publicly on the effectiveness of its performance in constraining the monopoly pricing power of regulated NSPs until September 2021. There has been no public ex-post evaluation of the AER's performance since 2014.

The national electricity rules established before 2006 transferred economic regulation of networks to the AER from the jurisdictional regulators. They were developed under conditions where jurisdictions other than Victoria and South Australia owned the regulated networks. Dividends, tax equivalent and debt lending margins from regulated networks were a significant source of total jurisdictional revenue and remain so for networks in public ownership.

[131] AER. AER Strategic Plan 2020-2025. 2020. Page 28.
[132] AFR. Auditor-General Margaret Crawford slams NSW government's 2016 Ausgrid lease. 11 December 2018.
[133] ACCC and AER. ACCC & AER annual report 2020-21. 20 October 2021.

The original rules clearly limited the AER's ability to constrain excess returns and excess investment. The Better Regulation reform program, which began to take effect from 2014, was intended to remove these limitations.[134]

7.2 False Theory That Excessive Profits Have Reliability Benefits

There is a widespread view that reliability benefits partly offset the efficiency impacts of excess supernormal profits.[135] Economic regulators typically consider supernormal profits to be a better outcome than underinvestment in network infrastructure.

This reflects an asymmetry between the impacts of supernormal profits on the one hand and the economy-wide economic impact of widespread network capacity constraints on the other. Network constraints from underinvestment would mean that supply is less reliable and there are more frequent and longer supply interruptions.

The investment asymmetry risk theory is, however, false under the NEM network regulatory system. The supernormal profits identified in this report are *after* all new capital investment. The data, therefore, demonstrates that excess returns are not, in fact, being reinvested in regulated assets in accordance with the investment asymmetry theory.

The asymmetry risk theory may have been valid under earlier versions of the current cost building block methodology used by the AER and other Australian regulators to set efficient regulated prices. Under building block regulation approaches, as applied by the AER since its 2014 Better Regulation reforms, the gold plating problem is dealt with directly, not indirectly, via regulating the rate of return.

Capital expenditure to augment regulated network capacity can only be recouped from regulated revenues. If actual capital expenditure exceeds the permitted levels, then network returns will be reduced.

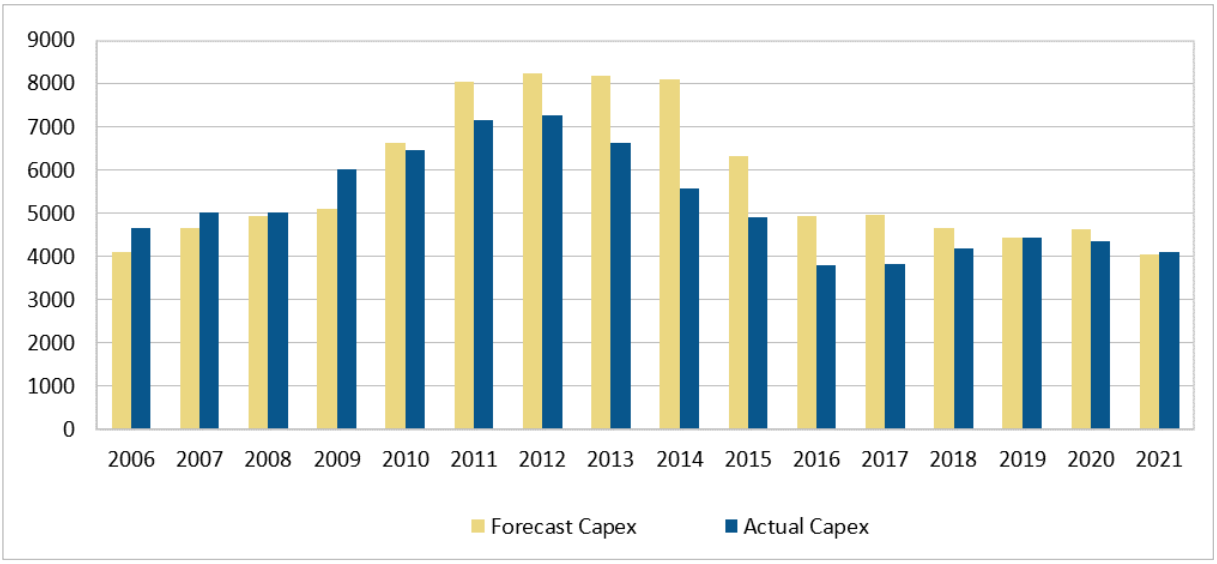
Overall capital expenditure is implicitly approved via changes in all of the four main cost building blocks: operating expenditure, depreciation, return on capital and tax. In addition, there are further regulatory controls on capital expenditure in the form of the regulatory investment tests, the capital expenditure efficiency sharing mechanism and the demand management incentive schemes.

The AER's Better Regulation program has successfully constrained capital expenditure to allowed levels. This avoided extensive cases where networks overspent or underspent their approved capital expenditure allowances to increase profits. As shown in the AER's 2021 network performance report, total capital expenditure over the 2014-2021 period has underspent the allowance for five out of the eight years. In the last three years, forecast and actual capital expenditure have

[134] AER. Overview of the Better Regulation Package. 2014.
[135] AER. State of the Energy Market Report 2021. 2 July 2021. Page 146.

been similar. For transmission, unusually, actual capex exceeded allowed capex in 2021 and this may have contributed to the absence of supernormal profits in 2021. Underspending of capex allowances for most years within the period is further evidence that supernormal profits are not resulting in higher than forecast capital expenditure levels (Figure 22).

Figure 22: Forecast vs Actual Capital Expenditure — Distribution Total ($m 2021)



Source: AER. Electricity network performance report 2022. Electricity DNSP Operational performance data - 2006-2021 (XLSX 541.27 KB)

The current constraints on capital expenditure, while effective given relatively low rates of capital expenditure over 2014-2021, are nevertheless imperfect—particularly because capex allowances that are not spent are still charged to the consumer and, in the end, flow as profit to the shareholder. The current approach to capex allowances may not be adequate under the very large and rapid levels of transmission capital expenditure required for the energy transformation. While the CESS creates incentives to avoid increases in distribution capex (or unspent capex), this may be less effective or not effective for constraining transmission capex for projects designated as ISP priorities.

7.3 Ambiguity in Rules Over Return on Capital and Equity

There appears to be ambiguity in the Rules as to whether the rate of return that matters for the purpose of the national electricity (and gas) objective is the "allowed" or the actual rate of return on equity. The ambiguity in the rules appears to have contributed to the substitution of the allowed rate of return for the actual rate of return in most assessments of whether economic regulation is effective.

Investors are concerned with actual returns, not allowed returns. Investors form their expectations for future investment based on actual returns. This means that investors form their expectations based on actual profits, including supernormal profits, not normal profits. The existence of supernormal profits is, however, ignored entirely in the methodology and data used to apply the RORI.

Similarly, actual returns are what matter when assessing whether regulatory outcomes conform with the national electricity (and gas) objectives. The revenue and pricing principles in the NEL refer to "allowing a return commensurate with the regulatory and commercial risks involved in providing the direct control services to which the price or charge relates".[136] The revenue and pricing principles clearly refer to the actual return, not the "allowed" return.

The AER provides a clear definition of the difference between, but equivalence of, the "allowed" and actual return on equity in an explanatory note accompanying the network performance report 2022.

The distinction between the normal and actual profits (or allowed and actual returns on equity) is an essential feature of incentive regulation. Under incentive regulation, regulated entities have the opportunity to outperform the target return on equity by increasing their productivity and performance.

The 2018 changes in the rules regarding the estimation of the return on capital (and equity) for the purpose of estimating required annual revenues (ex-ante) appear to have reinforced apparent ambiguity in the rules over the definition of the return on capital (and equity). These accompanied the introduction of the 2018 mandatory RORI via changes to the NEL (Division 1B).

The changes removed the previous reference in the rules to the "rate of return". The rate of return objective and reference to the return on equity (and debt) were removed. They were replaced with a single reference to the *allowed* rate of return. The guidance on the rate of return instrument in the NEL is largely procedural. It provides no further clarification of the definition of the rate of return.

[136] NSW Government. National Electricity (NSW) Law No 20a of 1997. Current version for 20 May 2021 to date (accessed 2 September 2022).

Box 5: Defining the Rate of Return on Equity, Real Rate of Return on Equity and Return on Regulated Equity[ix]

The AER defines the rate of return on equity (ROE) as regulatory net profit after tax (NPAT) divided by regulated equity.[x]

The real return on regulated equity (RROE) excludes returns from indexation of the RAB.

The AER refers to the actual return on equity received by networks as "return on regulated equity" (RROE).[xi]

The AER states that the "RORE[xii] measure can be compared against the NSPs relevant rate of return, other NSPs in the sector and Australian and international regulated businesses where the RAB is valued on a similar basis to that of the NSP".[xiii]

In setting regulated prices, the AER currently makes no reference whatsoever to the RORE measure. Instead, it refers to the expected return rate resulting from a financial theory known as the Sharpe-Lintner capital asset pricing model (SL-CAPM).

The AER stated:[xiv]

Based on the evidence currently before us we consider that:

- *The Sharpe-Lintner CAPM is the most appropriate asset pricing model to use in our foundation model approach to estimating the return on equity.*
- *The data currently available from listed and delisted Australian energy networks is sufficiently robust to provide a reliable empirical estimate of equity beta.*

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ix. AER. Electricity network performance report 2022: Explanatory note – Return on regulated equity. September 2022.
x. AER. Electricity network performance report 2022: Explanatory Note – Return on regulated equity. September 2022.
xi. Note that throughout this report we also refer to this as actual RROE for simplicity.
xii. Note RORE = Return on Regulated Equity. The AER refers to the actual return on equity received by networks as 'Return on Regulated Equity'.
xiii. AER. Electricity network performance report 2021: Explanatory Note – Return on Regulated Equity. September 2021.
xiv. AER. Rate of return instrument Explanatory Statement. December 2018.

7.4 Weak Transparency Increases Information Rents

Weak transparency over network profit performance appears to contribute to much higher than efficient information rents. The NEL provides for network service performance reports, such as the AER's annual network performance reports, including the profitability and efficiency of NSPs (see section 28V of the NEL).[137] For more than seven years of network performance reporting following the Better Regulation reforms, no data was publicly provided on network profits.

The NEL requires liable entities under the retailer reliability obligation to report their net contract position (section 14P of the NEL).[138] Similarly, liable entities are required to establish arrangements to monitor compliance, and the AER is empowered to undertake compliance audits or require compliance audits are carried out (see Division 1C of the NEL).[139] It seems anomalous that the NEL requires transparency regarding retailer reliability but not on the effectiveness of economic regulation of electricity networks.

Networks are required to provide RIN responses to the AER. These responses include the provision of financial data, including before-tax data. However, there is no requirement in RIN reporting to compare allowed and actual RROE, and RIN reporting often does not include income tax data.

Some limited data was provided on the real return on assets (RROA) from 2018. However, the RROE data is crucial because the RROE measure accumulates all errors in the AER's estimate of actual network cost, including all errors in estimating the cost of capital. As networks are capital intensive, the cost of capital is a key component of total network costs. The RROA data does not fully reveal errors in estimates of the cost of capital.

7.5 Reliance on False Corporate Finance Theory Over Evidence

A key cause of the failure of regulation to constrain the supernormal profits problem is an overreliance on financial theories accompanied by a refusal to test these theories empirically.

In setting regulated network prices, the AER currently makes no reference whatsoever to the actual RROE outcomes. The AER and most Australian jurisdictional regulators use the Sharpe-Lintner capital asset pricing model (SL-CAPM) to determine an *expected* rate of return and then set the regulated revenue for networks and network prices using that.

[137] South Australian Government. *National Electricity (South Australia) Act 1996*, section 28V.
[138] South Australian Government. *National Electricity (South Australia) Act 1996*, section 14P.
[139] South Australian Government. *National Electricity (South Australia) Act 1996*, Division 1C.

However, the SL-CAPM has been refuted.[140] The problem with SL- CAPM and the CAP theory more broadly is that the market portfolio at the heart of the theory is both theoretically and empirically elusive. The CAP theory may not meet the widely adopted test for whether it qualifies for the status of an empirical theory—the possibility of empirical refutation or falsifiability.[141]

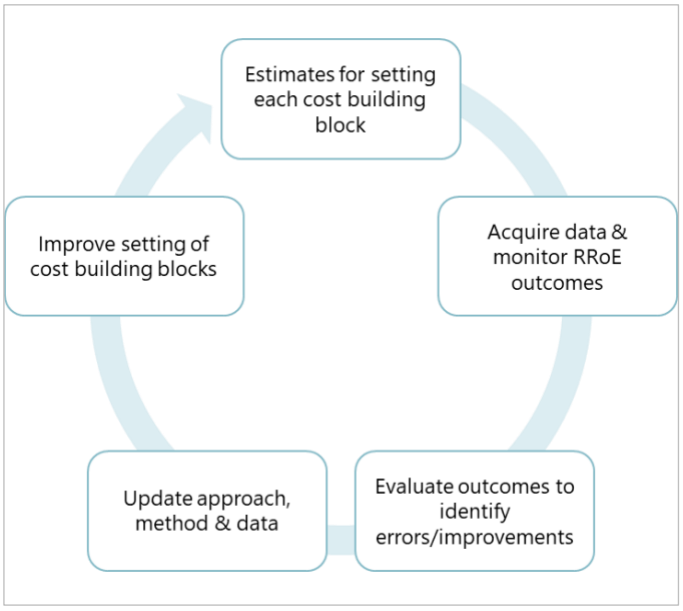
An empirically testable definition of the expected rate of return for Australian networks would focus on the 140 observations over the seven years for which data is publicly available. Under an empirical definition, the expected RROE is 85% higher than the AER's definition of the "efficient" RROE.[142]

7.6 Information Asymmetries Are Reinforced Not Corrected

The AER is not adequately correcting errors in its economic regulation of networks' return on capital, such that errors are being reinforced rather than corrected. This is one of the reasons supernormal profits have been evident.

With some cost building blocks, including operating expenditure, for example, the AER uses an error correction model. This is depicted in Figure 23.

Figure 23: Error Correction Model of Economic Regulation



Source: Author.

[140] Fama, Eugene, F., and Kenneth R. French. 2004. The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives*, 18(3): 25-46.
[141] Karl Raimund Popper. Conjectures and Refutations: The Growth of Scientific Knowledge. 1962.
[142] Note the present analysis is not seeking to overturn the AER's estimate of the efficient rate of return but is questioning its definition of the expected rate of return.

The feedback loop means that any errors or changes over time in step 1 will be identified from data collection and analysis in steps 2 and 3. The outcome of this error correction process (steps 4 and 5) is then applied to the following regulatory control cycle (step 1).

Box 6: The Cyclical Model of Regulation

Under incentive regulation, regulated entities may outperform (underperform) the target RROE by reducing one or more of operating expenditure, depreciation, debt financing and tax cost building blocks, relative to regulatory allowances or exceeding performance benchmarks where performance incentive schemes apply. In doing so, regulated firms reveal efficient costs and any errors in the ex-ante setting of performance targets (both overestimates and underestimates of efficient costs). Provided this information is monitored, actual performance data can be reflected in decisions for setting new efficient cost benchmarks for the following regulatory price control period.

The AER describes the process as a cyclical model of regulation consisting of a repeated cycle of three steps.[xv]

1. *Determining the NSPs' revenue allowances based on the best available information, recognising that the NSPs can outperform (underperform) those targets and keep (lose) some of the benefits.*

2. *Collecting accurate and reliable data on the networks' performance against those targets.*

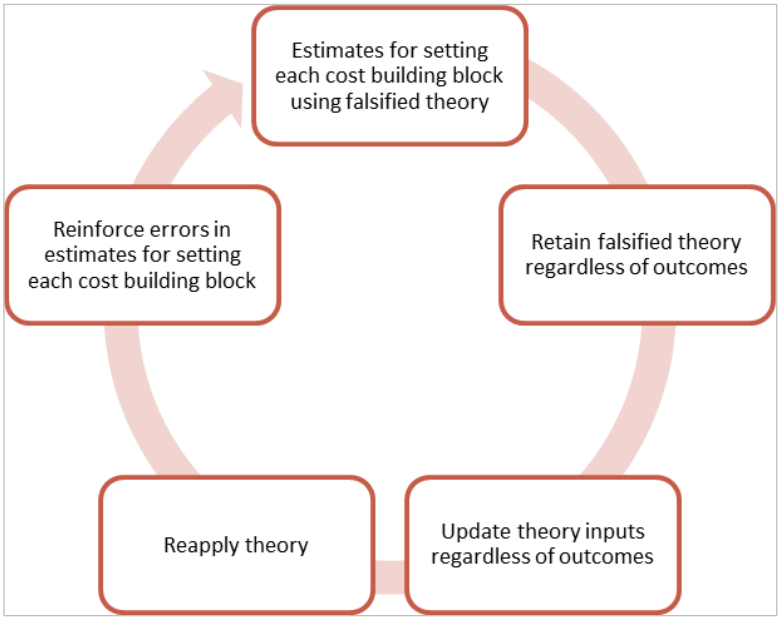
3. *Using that information to inform future revenue setting processes, sharing the benefits of network efficiency gains with customers.*

—

[xv] AER. Electricity network performance report 2021. 22 September 2021.

The error correction cycle is, however, not being applied to the return on capital cost building block. For return on capital cost building block, the error correction model has been replaced by an error reinforcement model, shown in Figure 24.

Figure 24: Error Reinforcement Cycle



Source: Author.

In this error reinforcement model, once data is available regarding the actual debt costs and actual return on equity, this data is not fed back into the model to improve the AER capital cost forecasts. There is no point in the cycle where the ex-ante theory and assumptions are tested and subjected to standard performance evaluation processes.

7.7 Risk Transfer From Networks to Consumers Is Ongoing

Networks are being compensated for operating with a certain level of risk that they do not actually bear because the risks are transferred to consumers under the rules. However, these risk transfers are not fully reflected in changes to the methods used to set regulatory cost estimates for the cost of debt financing.

The move to a roll-forward model for determining the opening RAB was formally completed with the rewriting of Chapter 6 and introduction of Chapter 6A of the NER around the time the AER was established. This risk transfer reflected a grand bargain under which jurisdictions transferred economic regulation to the AER but wrote rules that protected dividend streams to then predominantly publicly owned networks in most of the NEM outside Victoria and South Australia.

The risk transfer process under the NER is ongoing. For example, network tariff reform following the AEMC's Demand Side Participation Review has increased inter-annual and intra-annual revenue smoothing. Variation in sales and revenues for regulated entities is being reduced even further. Under tariff rebalancing, an increasing proportion of total regulated revenue is obtained from fixed (daily connection) charges. In addition, marginal network prices are being inefficiently

applied to infra-marginal capacity via monthly capacity and demand.[143] Tariff reform is removing a substantial proportion of seasonality and sensitivity of revenues to variations in sales volumes year on year. Networks are being protected from falling per customer demand due to the uptake of consumer energy resources.

These rule changes do not reduce risk—but instead transfer risk to consumers. For example, asset stranding risk is not reduced by shifting this risk from networks to consumers. Indeed, it is likely to increase because unlike networks, consumers do not make decisions over the quantity and timing of asset augmentation resulting in asset stranding risk. As a result, consumers are both paying higher network charges for these risks and, at the same time, bearing these risks.

The very substantial risk transfers under the rules mean that economic and financial risks for regulated entities are almost entirely neutralised. Any risk to sales volumes from changes in market structure and/or substitution by competing services have little or no bearing on network revenue and EBIT. The major residual risks borne by the network businesses are non-systematic operational risks.

The benefit of regulatory risk reduction in favour of networks has become more substantial as electricity consumption and power prices gradually decoupled from the broader economy. This decoupling is important because earlier observations for the measurement of systematic risk are unlikely to be a useful guide to the recent and future benefit of this risk reduction for networks.

7.8 Barriers to Effective Consumer Representation

Flaws in the NEL and the wider regulatory system discussed above create barriers to effective consumer representation in network regulatory processes, despite a substantial increase in AER support for consumer participation. For example, the Consumer Reference Group appears to be constrained by the absence of data on supernormal profits and the ambiguity in the NER's definition of the return on equity.

Energy Consumers Australia appears to receive higher performance ratings by regulated networks and regulators than by consumer groups.[144] Energy Consumers Australia refused three proposals to support research into evidence of excessive supernormal network profits between 2018 and 2021.[145]

[143] See Orme, Simon, and James Swansson. Errors in Australian Energy Regulator's Draft Decision on Ergon Energy's 2016 Tariff Structure Statement. November 2016.
[144] See KPMG. Review of Energy Consumers Australia; Final Report – Effectiveness of Roles and Functions. March 2019. Page vi.
[145] Applications for Energy Consumers Australia funding from the National Irrigators Council (2018), CANEGROWERS (2020) and an approach by the author of this report in October 2021.

8 What Is to Be Done?

Fast and effective action is required to make economic regulation effective, and to constrain supernormal profits.

Previous attempts to improve the performance of the NEM institutions, specifically network economic regulation, have been unsuccessful.[146] One reason is earlier attempts relied on the existing NEM institutions without acknowledging that institutional arrangements and cultures are contributing to poor regulatory outcomes.

A key issue is that standard parliamentary accountability mechanisms, such as regular reviews by Auditors-General, do not appear to be applied to NEM institutions. The impetus for reform, therefore, needs to be driven from outside the existing NEM institutions.

8.1 Commission Is Required

We recommend that the Australian Government establish an independent commission of inquiry into the performance of NEM institutions and arrangements, working jointly with participating NEM jurisdictions.

The scope of the commission could be wider than regulation of energy networks. With respect to energy networks, the commission's terms of reference should address the following matters.

8.1.1 Introduce Effective Reporting and Monitoring Arrangements

8.1.1.1 Performance Metric/s

In the Energy Ministers meeting on 12 August 2022, it was agreed that new Statements of Expectation would be developed for the energy market bodies.[147]

The Statement of Expectation for the AER should include a performance outcome metric against the current Objective 3 of its Strategic Plan 2020-2025 that consumers pay no more than necessary for safe and reliable electricity. More specifically, a performance metric could be defined relating to limiting the ability of regulated networks to extract excess supernormal profits.

8.1.1.2 Performance Reporting and Monitoring

Electricity networks and gas networks should regularly report their performance against the established performance metric/s, similar to arrangements already in

[146] Productivity Commission, Better Regulation, Vertigan Review—addressed further in this report. For example, the Australian Competition Tribunal decision overturned the AER's attempt, following the Better Regulation reforms, to reduce some aspects of excessive network returns.
[147] Department of Climate Change, Energy, the Environment and Water. Meetings and communiques. 12 August 2022.

place for retailers under the retailer reliability obligation. The regulated networks should provide regular profit reports, and the AER should consolidate and analyse the reports to evaluate whether consumers are paying no more than necessary for the safe and reliable supply of electricity network services.

Annual public performance reporting to independently assess how well the AER and AEMC are performing in achieving value for money for consumers should be performed, led by state and federal governments' Auditor-Generals.

Regular AER reporting of its own performance should be backed up by the provision of regular organisational evaluation reports to the COAG Energy Council by the Ministers responsible for the AER. This would enable jurisdictional Ministers to report to their own Parliaments on the performance of the NEL in their jurisdiction.

8.1.2 Comprehensive Set of Changes to the National Electricity Law

A comprehensive set of changes to the NEL is required to improve economic regulation of networks. This should include the following.

8.1.2.1 Revenue and Pricing Principles

The revenue and pricing principles in the NEL (shown in Appendix B) should be amended to make clear what constitutes reasonable returns to equity investors, including:

- Clarify what constitutes a reasonable risk-adjusted return to equity investors, including by clarifying that the actual real return on equity is the principal performance metric under the NEL and incentive regulation, not the estimated return on equity.
- Consider replacing the word "commensurate" with "correspond" in section 7A(5), since any conceivable supernormal profit levels are in fact "commensurate" with efficient equity financing risks and costs.
- Remove the current unfounded suggestion in the revenue and pricing principles that higher (lower) network profits result in increased network investment and, therefore, higher (lower) reliability should be removed.

8.1.2.2 Performance Evaluation Framework

Under current arrangements, it does not appear to be possible for the Parliaments of each NEM jurisdiction to hold the economic regulator accountable. Within the NEL, a clear outcomes-based performance evaluation framework should be established for the AER's functions with respect to network regulation. This should set up a framework that checks the AER's performance against the relevant performance metrics (explored above).

Changes could be made to the rules to require regulated electricity (and gas) networks to provide profit reports and the AER to consolidate and compare in its

annual reporting (NEL, section 28V). This is necessary for evaluating whether economic regulation outcomes are consistent with the NEL and National Gas Law. The new reporting obligations could be modelled on the equivalent provisions in the NEL for reporting compliance of liable entities with the retailer reliability obligation. Network reporting would operate under AER guidelines to ensure consistency and comparability between networks.

8.1.2.3 Timely Network Disclosure of Profits and Explanation for Variances with "Allowed" Returns

The NEL should require regular and full disclosure of profits by networks and consolidation and assessments by the AER in annual network performance reporting.

8.1.2.4 Change Provisions Regarding the Rate of Return Instrument

Specific provisions regarding the RORI should be changed, including:

- Changes to the NEL provisions regarding the RORI to allow the 2022 RORI outcome to be amended in 2023. This is to correct a continued reliance on a false capital pricing theory and use of assumptions instead of data throughout the 2022 RORI review so far.

- Amendments to the 2022 RORI process should be implemented without the usual delay of up to five years. In IEEFA's view, the past delayed implementation of RORI to estimate the allowed RROE is based on the false assumption that supernormal profits are not excessive and that immediate implementation of the new RORI parameters would be consistent with the revenue and pricing principles and the National Electricity Objective. Correcting errors in the RORI would not be equivalent to "regulatory takings."[148] The immediate implementation of a corrected RORI is necessary to prevent future sector-wide excessive supernormal profits.

8.1.2.5 Improved Guidance Regarding Cost Building Blocks

The AER's methodology regarding the design and operation of incentive schemes and the estimation of cost building blocks should be improved.

Changes should also be made to the rules regarding the overall impact of incentive schemes to tie these more closely with productivity benchmarking. Incentive schemes should not provide significant financial rewards for network entities that have average or relatively low levels of total productivity or performance.

The data used to compare efficient opex between networks needs to be improved. The AER adopted most aspects of a 2018 independent review of the methods and data contributing to estimates of efficient distribution network operating and

[148] The doctrine of regulatory takings does not strictly apply in Australia but is sometimes presented as an argument that correcting previous regulatory errors raises equity financing costs and hence is not in the long-term interests of consumers. This argument is not valid given the existence of persistent sector-wide excess supernormal profits.

maintenance expenditure. Vegetation management opex is a key unresolved matter from the review. Improvements to data and methods used to estimate the impact of vegetation management on efficient opex would reduce this error.[149]

8.1.2.6 Safeguard Mechanism

Changes could be made to the NEL and rules to provide safeguards to prevent persistent, substantial excess returns. Under these changes, subject to some defined tests, unearned supernormal profits (or losses) could be returned in the form of lower prices. The New Zealand Commerce Commission applies this approach to Transpower.[150]

This would avoid outcomes where the shortcomings of the 2018 (or 2022) RORI continue to apply well after these errors are corrected in a 2023 RORI.

8.1.3 Improve Consumer Representation and Research Support

Changes should be made to remove barriers to the effective participation of consumer representatives in regulatory processes, including by improved transparency and disclosure, and better resource prioritisation by the AER. As noted earlier, a review of Energy Consumers Australia conducted by KPMG found it received the highest performance ratings by regulated networks and regulators and the lowest ratings from consumer advocates.[151] Somewhat confusingly, the KPMG report combines regulated networks, market bodies and regulators into a single stakeholder group. It appears no rating on Energy Consumers Australia performance was sought from unsuccessful grant applicants such as the National Irrigators Council and CANEGROWERS seeking funding to support research into persistent and substantial network supernormal profits.

8.1.4 Ensure Frameworks for Future Investment Are Efficient

To ensure frameworks for future investment, including energy transformation investment schemes, new jurisdictional schemes and the announced RNC are efficient, it will be necessary to ensure they do not contribute to supernormal profits.

[149] Orme, Simon et al. Independent review of Operating Environment Factors used to adjust efficient operating expenditure for economic benchmarking. Australian Energy Regulator. August 2018. Page 66.
[150] Transpower. 2020/21 Integrated Annual Report. 2021. Page 150.
[151] KPMG. Review of Energy Consumers Australia; Final Report – Effectiveness of Roles and Functions. March 2019. Page vi.

8.1.4.1 Ensure Theoretical Contestability for Non-Regulated Network Investment and Operation Where Possible

The AEMC is currently considering options to make regulated energy transformation capital expenditure by networks more contestable. This includes capital expenditure outside regulated network assets and service—for example, batteries and standalone power systems. NSW is also seeking to introduce contestability into regulated transmission.

Current barriers to contestability in non-regulated transmission investment need to be identified and removed. This includes addressing any jurisdictional arrangements that impair contestability. These include the existence of exclusive transmission licences and any exclusive privileges given to the jurisdictional transmission entity under jurisdictional infrastructure planning laws.

RNC underwriting and other arrangements to avoid delays to non-regulated and regulated transmission investment are likely to be necessary in some form. This reflects a combination of market and regulatory failures that lead to insufficient or delayed investment in network capacity augmentation to support the transformation. The RNC should avoid adopting any arrangements that contribute to excessive network supernormal profits or de facto monopoly pricing power for non-regulated networks.

8.1.4.2 A Wider Review of the Performance of Economic Regulation Is Needed

It is unlikely that economic regulation has failed only for electricity and gas networks. Commonwealth and jurisdictional regulators continue to apply refuted theories in setting regulated returns across a range of industries, and do not apply error correction methodologies.[152, 153]

Refuted corporate finance theories are currently applied to the setting of regulated prices across urban and rural water, sewage and flood infrastructure services, transport, communications, and other strategic sectors with natural monopoly characteristics. As with electricity and gas networks, any excessive supernormal profits across these other regulated sectors are also likely to impair affordability and Australia's international competitiveness.

The commission should identify whether regulatory systems for monopoly infrastructure in other sectors—not just the energy sector—may also be resulting in excessive supernormal profits, adversely affecting consumers and international competitiveness.

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[152] Queensland Competition Authority. Final report – Rate of return review. November 2021. Chapter 6.
[153] Independent Pricing and Regulatory Tribunal. Review of our WACC method – Final Report Research. February 2018. Page 48.

9 Glossary

ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
Biggar range	A proposed range of regulatory outcomes consistent with incentive regulation, being within an RAB multiple range of between 0.9 and 1.3.
CAP theory	Capital asset pricing theory—the Sharpe-Lintner version of this theory is used by the Australian Energy Regulator and many other Australian regulators to set the target RROE.
CRG	Consumer Reference Group established by the AER to provide consumer perspectives for periodic reviews of the mandatory rate of return instrument.
Debt	For rate of return purposes, the ratio of the RAB funded by debt according to the prevailing rate of return instrument—currently 60%.
DNSP	Distribution network service provider
EBIT	Earnings before interest and tax – the common numerator used for deriving allowed and actual percentage returns on RABs.
"Equity"	Non-indexed RAB minus book value of debt. For estimation purposes, 40% of regulated RAB is used throughout this report. Actual equity may be lower than this assumption.
Error correction	A process where cost estimates and assumptions are replaced with data to improve explanatory and predictive power of a theory or economic regulatory process or decision.
EV	Enterprise value, used by the AER as a crosscheck for the reasonableness of regulated revenues.

Excess supernormal profit	This refers to the portion of supernormal profits that are "unearned" under effective incentive regulation.
Expected range	A proposed range of regulatory outcomes consistent with incentive regulation, being within 10% below and 30% above outcomes where investors are compensated for the opportunity cost of capital but not more or less than this.
Expected RROE	The RROE (actual) referenced by prudent investors in determining whether returns are sufficient to compensate them for the risk adjusted opportunity cost of capital.
Financing charges	The cost of debt servicing reported by networks in their regulatory information notice returns
Incentive regulation	A form of economic regulation where firms may outperform or underperform efficient cost and performance benchmarks across all major cost building blocks.
ISP	Integrated System Plan
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules or "Rules"
NSP	Network service provider
ODRC	Optimised Depreciated Replacement Cost
Parameter estimation error	Errors arising from the fact the CAP model requires inputs that are not observable and therefore applies proxy parameters, likely to diverge from unobservable parameters in the model.
RAB	Regulatory Asset Base at a given point in time, excluding indexation.

RAB multiple	Multiple of economic value in transactions or estimates as a multiple of the RAB at a point in time.
Rate of return regulation	A form of regulation where the regulated entity receives a constant return on equity, even if revenues significantly exceed (or are lower than) allowed costs. Any material losses and gains are clawed back in subsequent periods. This is widely viewed as inferior to incentive regulation.
RIN	Regulatory Information Notice. RIN responses include some limited financial data, but typically do not include return on equity or the difference between the actual and "allowed" return on equity.
ROC	Return on capital—rate of return times RAB. The AER now uses the opening RAB for measuring the ROR. This is directly comparable to the Return on Assets – Earnings before interest and tax over opening RAB.
ROR	The actual rate of return on assets—EBIT over RAB.
RORE	Return on regulated equity. The AER sometimes refers to the actual return on equity received by networks as "return on regulated equity".
RROE (allowed)	Allowed RROE. This is the only measure now referred to in the rules, following changes in 2018.
RROE (actual)	Real return on equity (NPAT/non indexed RAB minus debt). The actual RROE with which incentive regulation is concerned.
RORI	Rate of return instrument under 2018 amendments to the NEL used to set the return on capital cost building block and a key determinant of network revenues.
RNC	Rewiring the Nation Corporation
SL CAPM	Sharpe-Lintner version of the CAP model which is the underlying capital pricing theory adopted by the AER and most Australian jurisdictional regulators.

Supernormal profit (loss) – dollar	The difference between total revenues and total costs, adjusted for the estimated opportunity cost of capital, expressed in dollar terms. If systematic, material, and persistent, supernormal profits reflect monopoly pricing power. Equal to total revenue minus (plus) total cost.
Supernormal profit (loss) margin	Actual profit or loss after tax minus "allowed" NPAT, as a percentage of "allowed" NPAT. Equal to total revenue as a percentage above (below) total cost.
Supernormal profit (loss) multiple	The ratio of actual profits to normal or allowed profits
Supernormal profit (loss) – percentage	The difference between actual NPAT, adjusted for the estimated opportunity cost of capital, and actual NPAT, expressed in percentage terms. If systematic, material, and persistent, super-normal profits reflect monopoly pricing power.
TAF	Transmission Acceleration Fund
TNSP	Transmission network service provider
WACC	Weighted average cost of capital. For network price setting, the AER uses the SL-CAPM to estimate WACC.

10 Technical Details

The broad steps in the data and methodology used to generate the results in this report are summarised below.

1. In the summary results tables for distribution and transmission in the AER published spreadsheet: Financial performance data 2022—Electricity networks—Public. Set pull down tabs for real returns (excluding indexation of RAB). Exclude transmission & jurisdictional scheme pass through gains and losses. Include performance incentives. For each group of networks, this automatically generates actual and allowed RROE excluding indexation and jurisdictional scheme timing effects. Note that Power and Water is excluded from the present analysis as data are only available for the latter part of the period. Note also data is missing for most Victorian distribution networks for 2021.

2. Convert percentage RROE results to dollar RROE results—NPAT. NPAT data are not reported directly in the public version of the AER dataset. Using the AER's detailed financial performance data for each network, copy dollar revenue, RAB and customer number data to allow it to be consolidated for all 140 network RROE observations.

3. Derive an estimate of the equity funded value of the non-indexed RAB, using the 40% equity assumption used to set the RROE (allowed) to ensure consistency with the quantification of normal NPAT. There were significant variances between actual and estimated RAB, due to variances in capital expenditure. To avoid double counting, only one RAB value is used (only one RAB value is available in the AER financial performance data, but two values are available in the AER operational performance data).

4. Multiply the percentage RROE and RROE (allowed) to derive actual and normal net profit after tax (NPAT) in real dollar terms for each of the 140 observations.

5. Deduct aggregate net supernormal profits and losses from total allowed network revenues to derive total "normal" or allowed network profits to identify the aggregate supernormal component of actual profits.

6. Add up all the supernormal profits and losses across the entire period to estimate net outcomes per year, per network, and in total over the entire period. This allows trends in dollar profit outcomes (positive and negative) over the period to be identified.

7. Disaggregate supernormal profit data by jurisdiction. Derive dollar net supernormal profit values for each jurisdiction.

8. Combine net dollar supernormal profit outcomes for each distribution network area, by adding the relevant regulated transmission supernormal profit to the distribution network area. Using the AER's average customer number data, estimate the supernormal profit per customer for each year for each network and in aggregate over the period.

9. Apply the aggregate net supernormal profit to the data in the AER's Table 4-6: Incremental contributions to return on regulated entity—simple average of all NSPs over 2014-2021. This allows the identification of the dollar impact of each incremental contribution to supernormal profits.

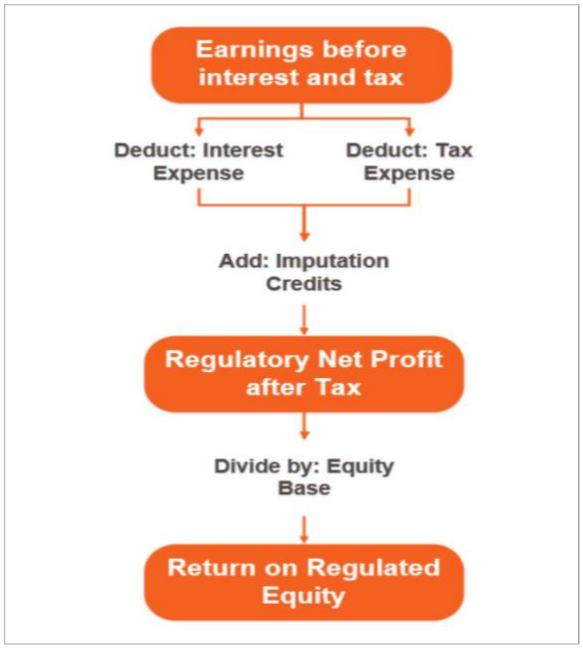
10. For each data point, derive actual profit as a multiple of normal profit. Apply the Biggar range for information rents to the resulting multiples. Order the data from lowest to highest. Measure the proportion of outcomes that fall within the 0.9 to 1.3 multiple range and the symmetry (asymmetry) around these outcomes.

11. Acquire the network productivity index data for each transmission and distribution network as estimated by Economic Insights and published annually by the AER. Compare network productivity index data with each of the 140 profit observations. Assess the extent to which differences in supernormal profitability outcomes correspond to differences in economic productivity index estimates. Note that for this part of the analysis, supernormal profits (losses) are measured as a percentage margin above (below) normal profits.

12. Use the AER's 2021 State of the Energy Market bill stack data for 2020 (which was only partly impacted by COVID-19) to estimate the contribution of excess network returns (both transmission and network) for retail bills for each network area.

The public version of the AER's data does not give NPAT. The AER has calculated NPAT according to the infographic below (Figure 25). The present analysis has reversed the final step below, using the same RAB values, with the addition of a gearing assumption.

Figure 25: AER Explainer of Relationships Between Return on Regulated Entity and Regulatory Net Profit After Tax



Source: AER.[154]

[154] AER. Electricity network performance report 2022: Explanatory note – Return on regulated equity. September 2022.

11 Appendix A: Relevant Rules and Their Effect on Risk

The table below summarises a selection of provisions in the current rules that reduce systematic and non-systematic risk for regulated networks providing direct control services.[155] The rules below refer to distribution networks, but similar rules also apply to transmission networks, with limited variations including for the more "lumpy" nature of transmission capital expenditure.

Rule	Effect on Risk (derived from AER cost of capital reports)
6.2.6	The AER adopts a control mechanism formula to calculate the total revenue that service providers may collect over a regulatory control period (and for each year of a regulatory control period). This control mechanism automatically accounts for indexation and annual increases in efficient input costs. The control mechanism that the AER adopts (typically in the form of a revenue cap), also ensures a service provider has a guaranteed level of total revenue that it may collect across the regulatory control period, regardless of unexpected changes in demand. This significantly limits risks to revenue.
6.3.2(b)	The term of each regulatory control period is at least five years, providing a fixed duration in which a service provider has a regulated return on its assets, revenue certainty, and fixed terms of access for its services. Among other things, changes to the rate of return instrument have no effect until the following regulatory control period.
6.4.3(a)(1)-(3), 6.5.1, 6.5.2, 6.5.5, S6.2.1, S6.2.2B, S6.2.3	The total revenue that the AER determines incorporates a return on and of the service provider's asset base. The historical asset base rolls forward from one regulatory control period to the next and from year to year within each regulatory control period. The NER guarantees recovery of historical asset costs through depreciation, the earning of a return on the asset base, indexation and recovery of future efficient capex. This substantially lessens risks in capital investment that might otherwise apply to a business operating in a workably competitive

[155] Australian Energy Market Commission. National Electricity Rules Chapter 6: Economic Regulation of Distribution Services (Version 183). 2022.

	market. An asset that is not utilised or productive may still provide a return under the NER through the setting and rolling forward of the asset base, the return on and of the asset base and the application of indexation.
6.5.9	X factors in the control mechanism smooth revenues across the regulatory control period and limit shocks from the last year of a regulatory control period before the start of the next. The AER sets X factors, among other things, to allow service providers to recover a revenue shortfall in one year in a subsequent year. Through X factors, service providers have a stable and certain level of revenue over each regulatory control period, with reduced risks of short- term revenue volatility.
6.18	The prices service providers may charge annually are certain. They are set through a regulatory process to approve annual pricing proposals.
6.5.2	The AER sets the allowed (ex-ante) rate of return on the opening RAB. Previous references to the rate of return (ex-post) were removed in 2018.156
6.5.3	Provision for tax in determining total revenue is required for a benchmark entity, without regard to whether the service provider pays tax.
6.5.6, 6.5.7	The AER assesses expenditure requirements for each service provider by reference to the amount necessary to meet a set of standards and objectives. These include the need to meet the expected demand for services and to meet quality, reliability, security, and safety standards. The AER does not assess expenditure by reference to the capacity of consumers to pay. This removes risks that could otherwise arise in providing a reliable and safe service. The AER reassesses the requirements of service providers for each regulatory control period to account for changes in market conditions and trends.
6.5.10	Allows service providers to pass through certain costs to consumers in circumstances where this might not be possible in a workably competitive market. For instance,

[156] Australian Energy Market Commission. National Electricity Rules – Chapter 6: Economic Regulation of Distribution Services (Version 94). Before 2018.

	the pass-through provisions provide for a pass through of costs that arise through regulatory change.
6.5.7(f), 6.6A, Chapter 5	Establishes a planning regime for DNSPs that assists in predicting future costs and appropriate planning for changes in the commercial environment. This includes provision for contingent projects during a regulatory control period and longer-term projects through the RIT-D process.
6.6.5	Is an additional pass-through mechanism for any material incremental capital expenditure following an unforeseen event—e.g., a natural disaster.
6.20, 6.21, 6.6.1(a1)(d), and RoLR provisions	Provides for a statutory billing and settlements framework with prudential requirements (and other similar provisions) to minimise financial risk associated with providing and charging for services. There is also provision for dealing with potential risks associated with retailer insolvency.

12 Appendix B: Relevant National Electricity Laws — Revenue and Pricing Principles

The relevant extract from the National Electricity Law—Section 7A Revenue and pricing principles[157]—is shown below. Those sections highlighted in grey are of particular relevance.

Part 1 — Section 7A

7A Revenue and pricing principles

(1) The revenue and pricing principles are the principles set out in subsections (2) to (7).

(2) A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in—

(a) providing direct control network services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment.

(3) A regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to direct control network services the operator provides. The economic efficiency that should be promoted includes—

(a) efficient investment in a distribution system or transmission system with which the operator provides direct control network services; and

(b) the efficient provision of electricity network services; and

(c) the efficient use of the distribution system or transmission system with which the operator provides direct control network services.

(4) Regard should be had to the regulatory asset base with respect to a distribution system or transmission system adopted—

(a) in any previous—

(i) as the case requires, distribution determination or transmission determination; or

(ii) determination or decision under the National Electricity Code or jurisdictional electricity legislation regulating the revenue earned,

[157] NSW Government. National Electricity (NSW) Law No 20a of 1997. Current version for 20 May 2021 to date (accessed 2 September 2022).

or prices charged, by a person providing services by means of that distribution system or transmission system; or

(b) in the Rules.

(5) A price or charge for the provision of a direct control network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the direct control network service to which that price or charge relates.

(6) Regard should be had to the economic costs and risks of the potential for under and over investment by a regulated network service provider in, as the case requires, a distribution system or transmission system with which the operator provides direct control network services.

(7) Regard should be had to the economic costs and risks of the potential for under and over utilisation of a distribution system or transmission system with which a regulated network service provider provides direct control network services.

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