Institute for Energy Economics and Financial Analysis

Australian consumers are paying too much for electricity networks

Simon Orme | Guest Contributor, IEEFA | Report Author

Tristan Edis | Guest Contributor, IEEFA | Report Support & Comms

Johanna Bowyer | Lead Research Analyst – Aus Electricity, IEEFA | Report Support & Comms

October 2022

Summary (1/2): Regulator data reveals regulatory regime is failing consumers

- This report examines information on monopoly electricity network businesses' costs and revenues provided by the Australian Energy Regulator (AER). It reveals the regulator has systematically and over an extended period of time allowed electricity networks to get **revenue from electricity consumers that substantially exceeds total network costs** (including financing costs and a reasonable return to shareholders).
- Over 2014 to 2021, electricity consumers in Australia's main electricity grid (the National Electricity Market or NEM) have been charged **$10 billion more** for electricity network services than necessary to ensure a reliable service.
- This equates to an extra cost per customer, depending on the state, of between **$800 and $1200 in excess** electricity charges over this period.
- This study does not suggest that network businesses aren't entitled to a decent profit – the issue is that their returns are **vastly in excess** of what is required for network businesses to finance a reliable and safe network.
- In addition, these excessively high returns or "supernormal profits" bear no relationship to network businesses' level of productivity or enhanced performance and reliability.
- Essentially, **consumers are paying nearly 11% more than necessary to ensure safe and reliable network service** that delivers consumers no future benefit in enhanced services or potentially lower costs.

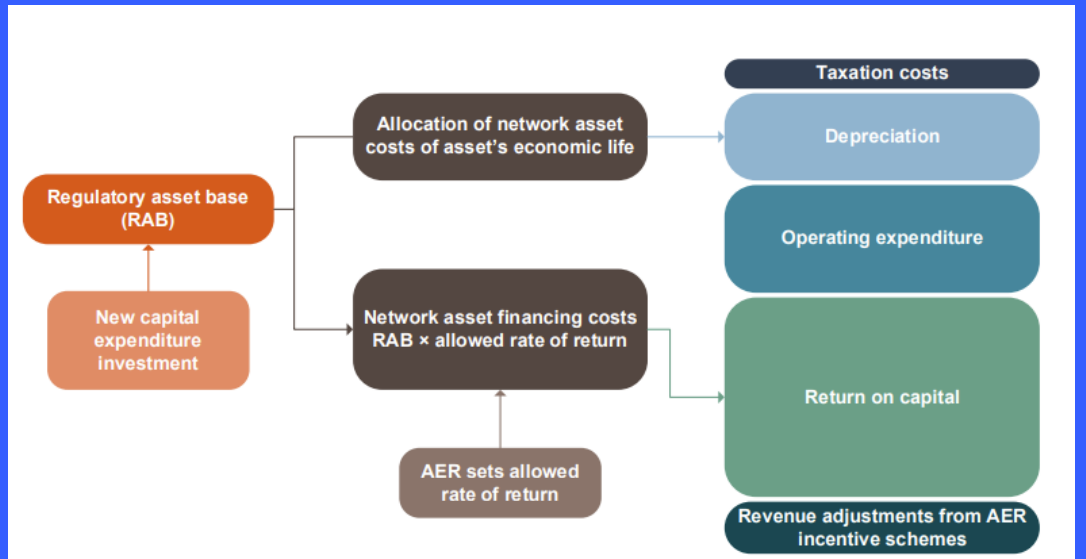
Summary (2/2): Regulator data reveals regulatory regime is failing consumers

- Many of the regulatory weaknesses reported in the study have been highlighted in previous research by the Grattan Institute (2012 and 2018), Garnaut Review (2011), Productivity Commission (2013) and by Professor Bruce Mountain of Victoria University.
- Despite efforts at reform introduced in 2014 (Better Regulation) and 2017 (abolishing limited merit reviews), the NEM **regulatory regime continues to be heavily weighted in favour of the shareholders** of electricity networks at the expense of consumers.
- As well as problems with significant unnecessary investment in physical assets (often referred to as "gold plating"), other weaknesses in the regulatory regime continue to **allow networks to set charges well in excess of costs**.
- The most significant is an overestimation of the cost of finance faced by network businesses given their low risk profile. But networks are also being granted excessive allowances across a range of areas covering operating expenditure, tax treatment, and incentive payments.
- This **excessive bias** in favour of network shareholders over consumers reflects weaknesses in the National Electricity Law (NEL), especially the revenue and pricing principles.
- The NEL does not require networks to report on the presence of supernormal profits and does not require profits to be comparable with regulatory and market risks faced by networks. It has been incorrectly assumed that supernormal profits result in higher investment with reliability benefits.
- Correcting regulatory failure will require a substantial program of reform including monitoring and reporting on supernormal profits, changes to the National Electricity Law and Rules to reduce supernormal profits, improving consumer representation in regulatory processes and ensuring frameworks for future investment are efficient.

Electricity networks in Australia are economically regulated

- Electricity network services providers (NSPs) in Australia are natural monopolies (as it is not efficient to build multiple electricity networks alongside one another), so subject to economic regulation[1] under the NEL and supporting Rules. The AER controls the prices NSPs can charge consumers to prevent exertion of monopoly pricing power.
- 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 NSP's total revenue requirement, based on estimates of NSP costs. This regulatory model is known as the "building block" model. The building blocks are summarised in the AER figure to the right.
- Regulatory periods in Australia are usually five yearly. Every five years, the AER determines the future revenue the networks require to cover their costs for the next five-year period, and networks charge approved prices to consumers via retailers.

The Building Block Model to Forecast Network Revenue



Source: AER analysis, adapted from AER, *State of the Energy Market*, December 2018, p.138.

1. Economic regulation refers to rules that limit who can enter a business (entry controls) and what prices they may charge (price controls).

Chart source: AER Electricity network performance report July 2022

Revenues over 2014-2021 have exceeded costs by $10 billion

- If regulation of electricity networks was effective, then for the average network in the average year, costs (including returns to financiers) and revenues should be more or less equal.
- However, the chart to the right illustrates that the revenue networks have been allowed by the AER to charge consumers is almost $10 billion greater than their total costs. This represents a supernormal profit.
- The excess revenue has been derived by IEEFA using datasets released by the AER in July 2022. Real rate of return on equity data in percentage terms is converted into dollar-based net profit after tax by applying the return on equity values to 40% of regulated asset bases that are financed by equity holders. The 40% ratio is used by the AER to set allowed profits and returns on equity.

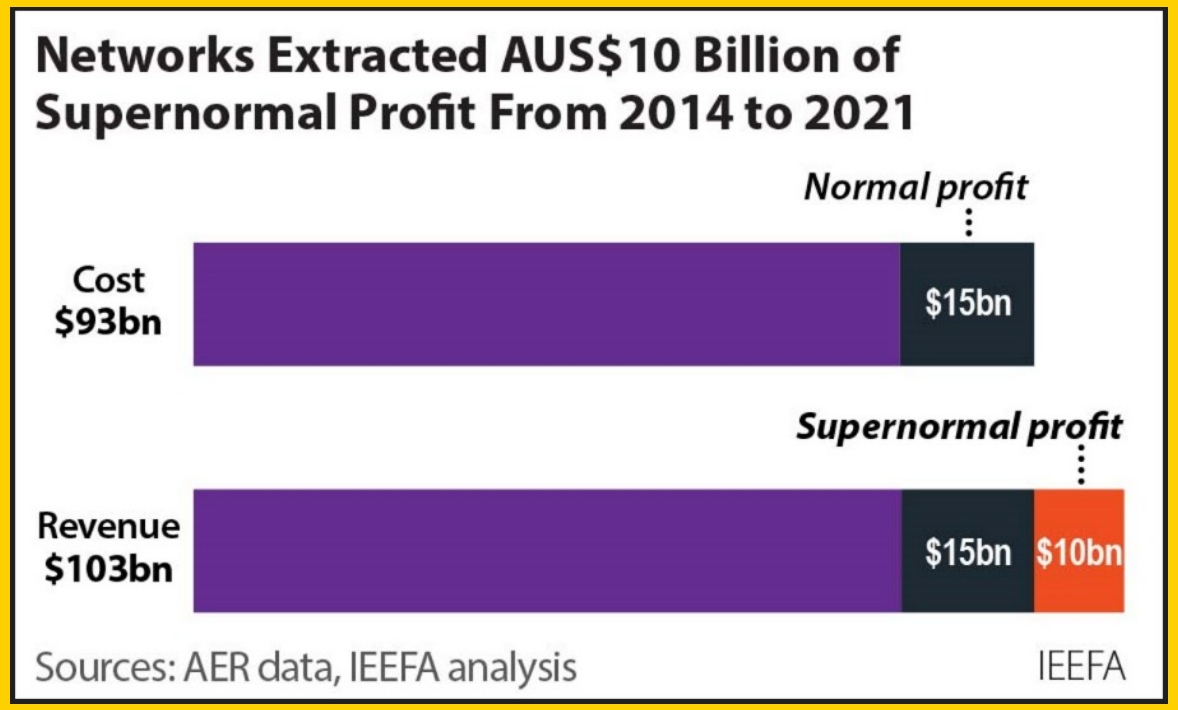


Chart data source: AER Electricity network performance report July 2022 data, IEEFA analysis

Multiple years of excessive returns

- The charts to the right, made with data published by the AER, show that equity owners of the electricity networks have realised returns (blue line) substantially above the level the AER estimated (white line) was needed to support necessary investment to ensure reliability.
- While there has been an overall decline in percentage returns over time, this was due to a fall in financing prices across international capital markets, not due to good regulation. The area where the regulator has control is in the extent of the gap between the equity return that is efficient and the actual rate networks have been able to capture.
- The issue is not just the scale of the difference, but also that this large difference has persisted year after year for eight years and a majority of two five-yearly regulatory revenue control periods.
- The moderation of distribution returns in 2016 was overturned by legal challenge. The moderation in transmission returns in 2021 appears to reflect capital expenditure timing. These excess returns do not include additional unearned returns due to a blowout in capital expenditure from 2008 to 2013.

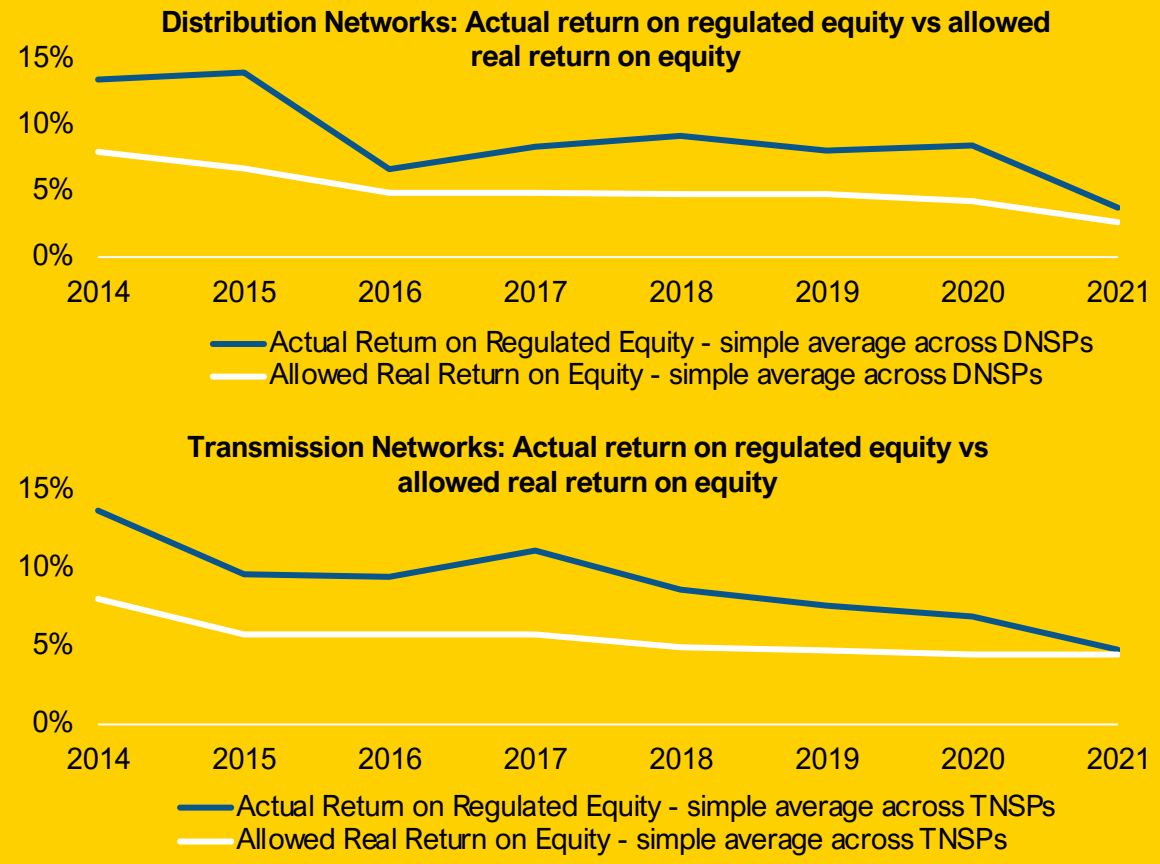
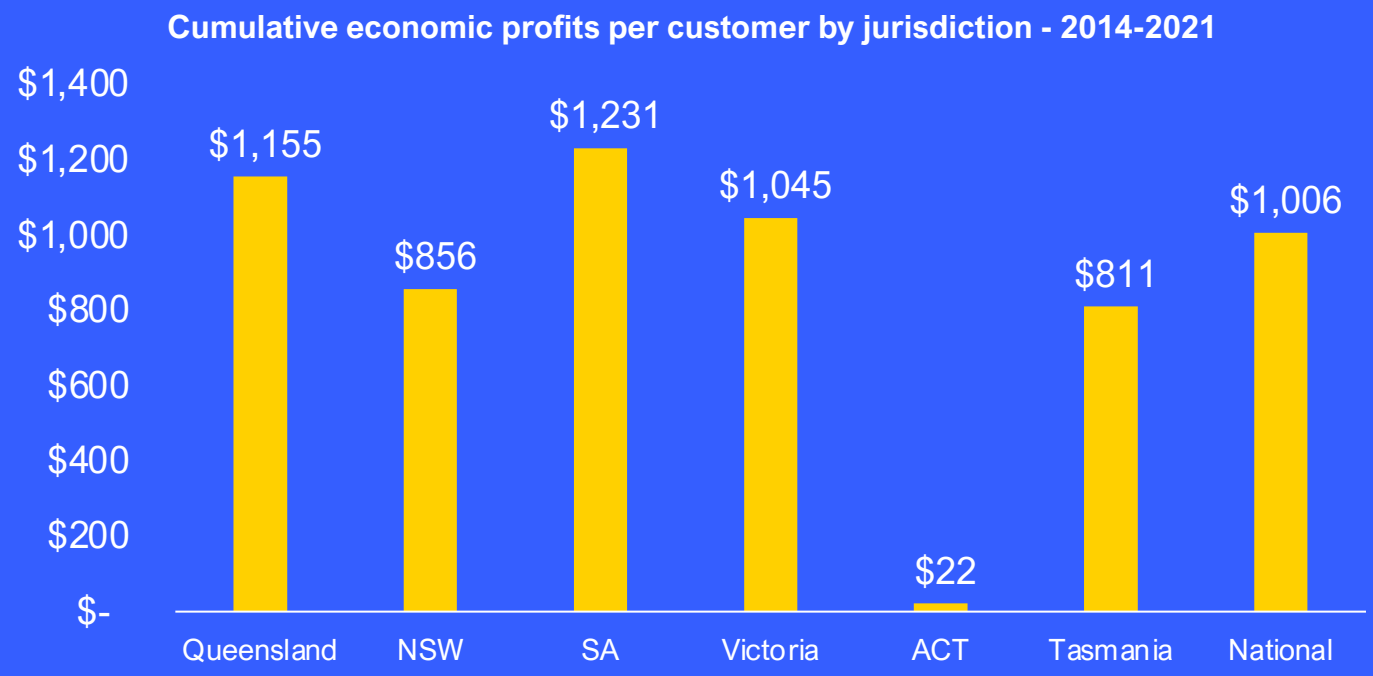


Chart data source: AER Electricity network performance report July 2022

$800-$1200 impact on customers

- The chart to the right shows the financial impact per customer across each jurisdiction flowing from the failure to efficiently regulate electricity networks in the NEM.[2]
- Customers across the NEM have paid around $800 to $1200 more than necessary for safe and reliable network services. Out of all NEM states, only the ACT managed to avoid these excess charges.



2. Western Australia is not part of the National Electricity Market and is excluded from this study. AER data for the Northern Territory is not available for the entire period.

Chart data source: AER Electricity Network Performance Report July 2022 data, IEEFA analysis

Sources of errors in favour of network owners

- The LHS of the chart shows the normal profit that network owners (equity investors) were expected to earn based on the AER's allowed and approved charges, which was $14.8 billion. The RHS shows that their actual profits were more than two-thirds higher, at $24.8 billion. The difference between the actual profit and normal profit was $10 billion (the "supernormal profit").

- The errors that led the regulator to hand networks a 67% higher profit than necessary are tied to misjudgments in:
  - the balance of financing between debt and equity (gearing)
  - the use of an inappropriate credit rating to estimate interest costs
  - "incentive" payments for average and even below average performance
  - mis-estimation of operating expenditure especially due to inadequate information on differences in vegetation exposures
  - delays in capital expenditure
  - lower tax payments
  - items equalling $666 million which the AER has classified as "other".

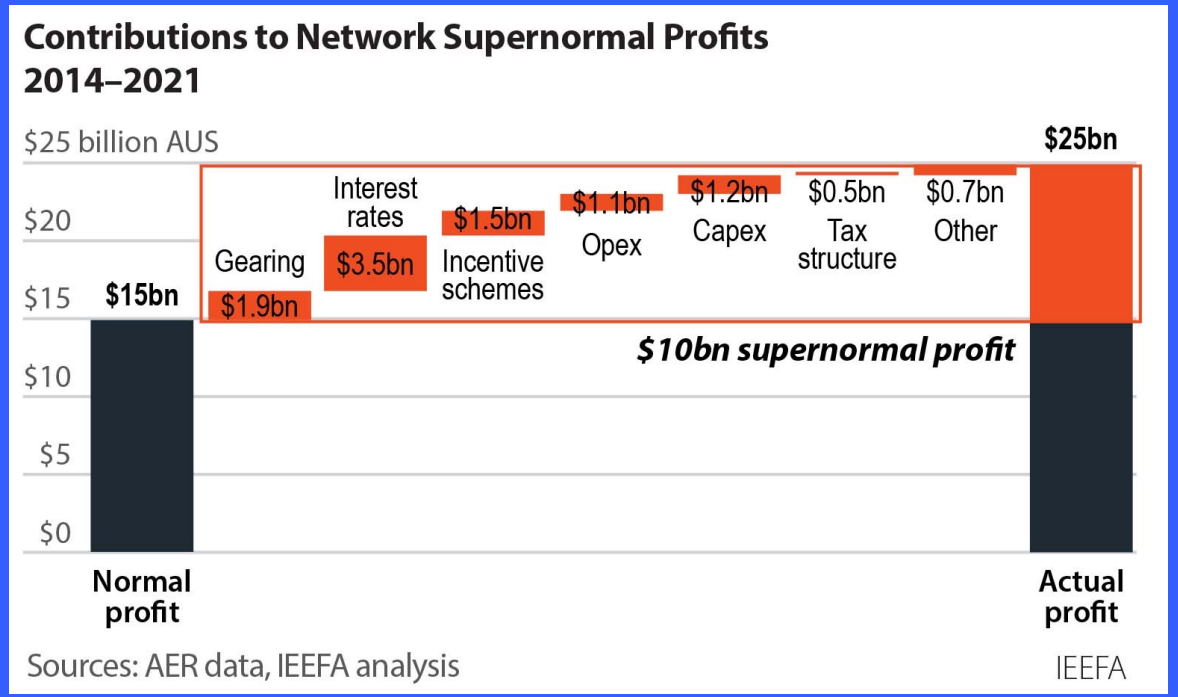
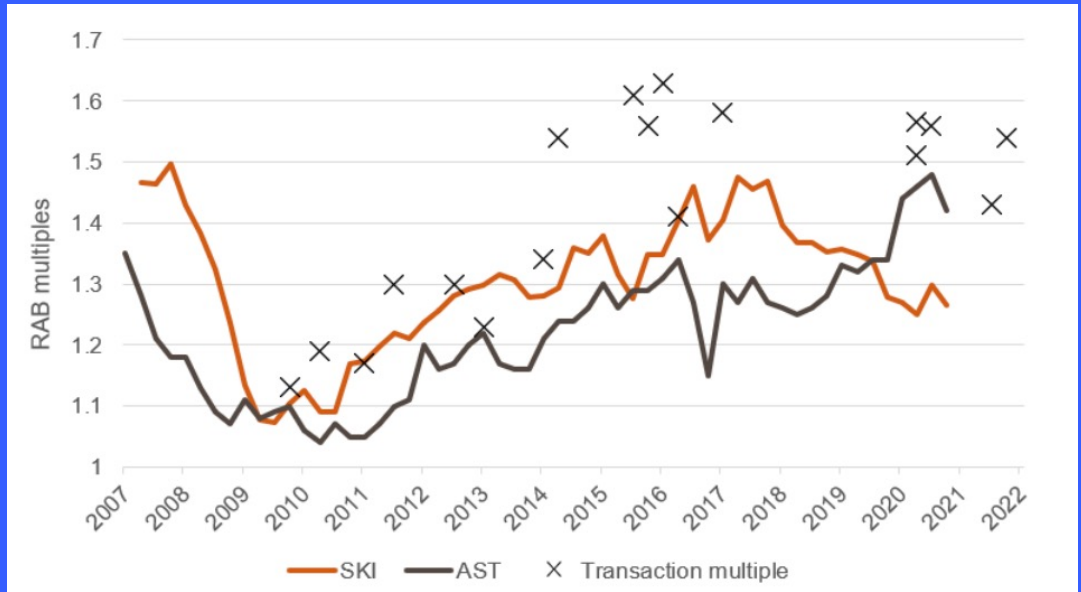


Chart data source: AER [Electricity Network Performance Report July 2022] data, IEEFA analysis

Excess returns for what? Investment risk appears low

- Electricity networks are not like a typical business in competitive markets. The rules under which the AER regulates networks have transferred almost all systematic risk over an economic cycle from regulated networks to consumers.
- Customer demand for network services has reduced compared with expectations, due in part to excess network charges. However, regulated revenues do not decrease to reflect lower demand – unit rates simply increase. Downside revenue risk has largely been removed, but upside opportunities from exceeding performance benchmarks have remained – **a one-sided option.**
- The **low level of risk which characterises these businesses makes them highly attractive to financiers** who are willing to provide them with debt at lower cost than the AER compensates networks for, contributing to supernormal profits.
- The chart to the right, sourced from the AER, shows how market transactions value various electricity networks relative to the book value of their regulated asset base (RAB). A multiple greater than 1 implies investors consider the future enterprise value (EV) will exceed allowed returns from the current RAB. For these two network entities, the multiple is consistently above 1 reaching a premium of more than 1.5 times RAB.
- The AER explanation for these sustained multiples is incomplete. The AER does not explain why the EV is relevant to assessing returns to equity, given that debt financiers do not benefit from supernormal profits.

AER regulated NSPs – transaction and trading multiples



Source: Morgan Stanley Research, AER analysis.[30]

Note: SKI is Spark Infrastructure, which holds ownership stakes in SA Power Networks (49%), Victoria Power Networks (49%) and TransGrid (15%). AST is AusNet Services, which owns a Victorian electricity distribution network, electricity transmission network and gas distribution network.

Chart data source: AER Electricity Network Performance Report July 2022

Profit outcomes well outside the expected range

- Regulating electricity networks to ensure they do not charge excessive prices is a challenging task – networks will always have superior information to the regulator, and it is important that networks are upgraded and well maintained to ensure reliability. One cannot expect that regulators will manage to set revenue exactly at networks' (often changing) actual costs.
- Dr. Darryl Biggar (Biggar), Special Economic Adviser to the ACCC, suggests that, due to the information disadvantage faced by the regulator, an Enterprise (EV):RAB multiple in the vicinity of 10% of the regulator targeted efficient level should be considered reasonable. He suggests that an error margin of plus or minus 20% on this figure could be considered a normal range.
- Dr. Darryl Biggar's range is better applied to the profit multiple (actual profit as a multiple of normal profit). This is because the only comparator for the rate of return on equity (profit) is the portion of total assets financed by equity – $40 billion not $100 billion. When the range is applied to profit multiples, only a third of outcomes over 2014-2021 are within the 0.9 to 1.3 multiple range, with the remaining two-thirds of outcomes exceeding a 1:1.3 ceiling threshold.

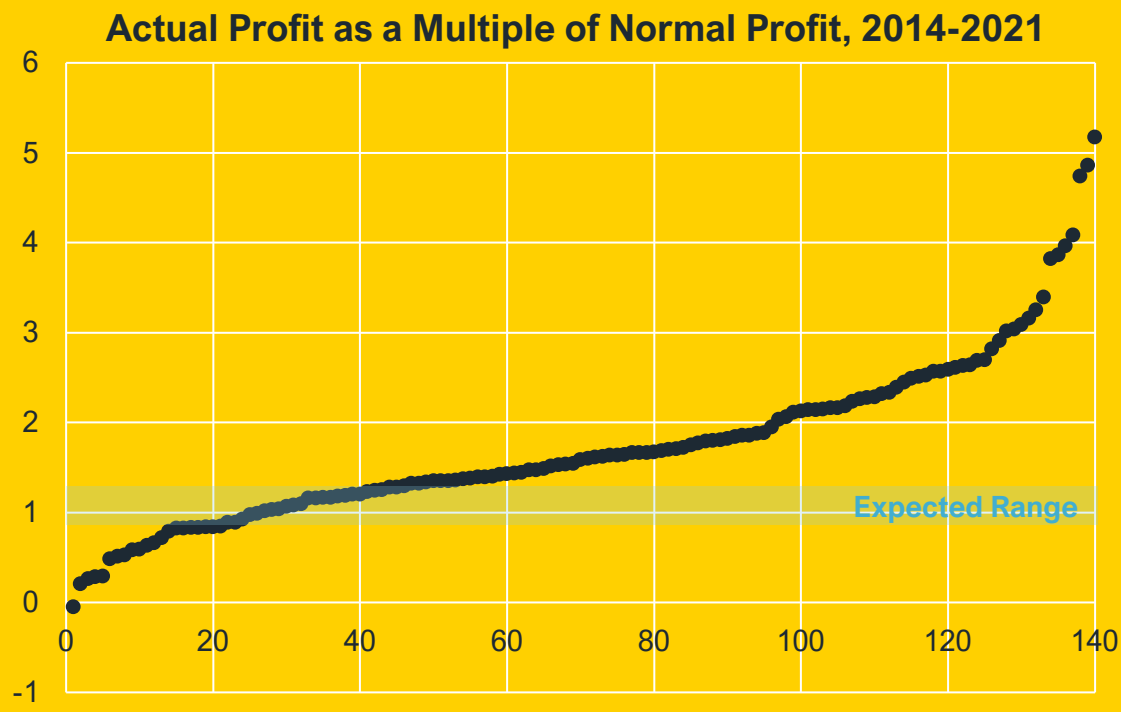


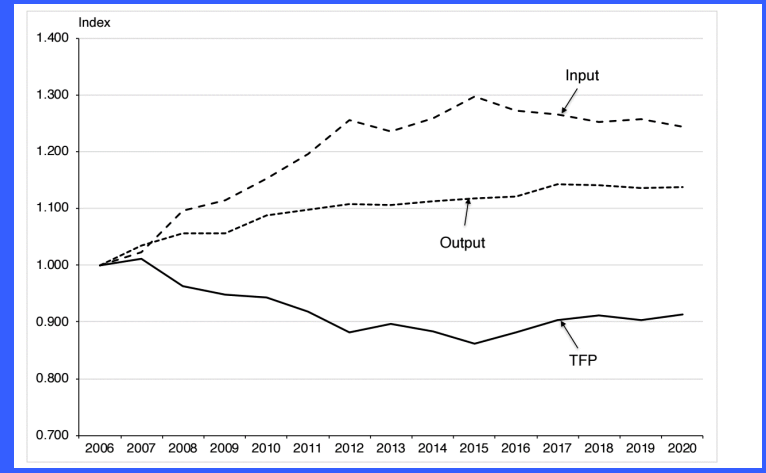
Chart data source: AER Electricity Network Performance Report July 2022 data, IEEFA analysis

Excess profits for what? Productivity has not improved (1/2)

- Super normal profits are not unusual, or undesirable in cases where a business innovates to deliver either a noticeably improved product to consumers or lower costs of production. This report does not argue that network owners shouldn't be able to capture enhanced profits if they achieve genuine improvements in productivity.

- However, there is no evidence to suggest that networks are achieving meaningful improvements in productivity that might justify their abnormally high returns. The charts to the right show that since network regulation switched to the AER in 2006, total factor productivity (TFP) has declined markedly. Over the period of our analysis (2014 to 2021), productivity has not declined, but neither has it improved appreciably across either distribution or transmission businesses.

Distribution network output, inputs and total factor productivity (TFP) for NEM



Transmission network output, inputs and total factor productivity (TFP) for NEM

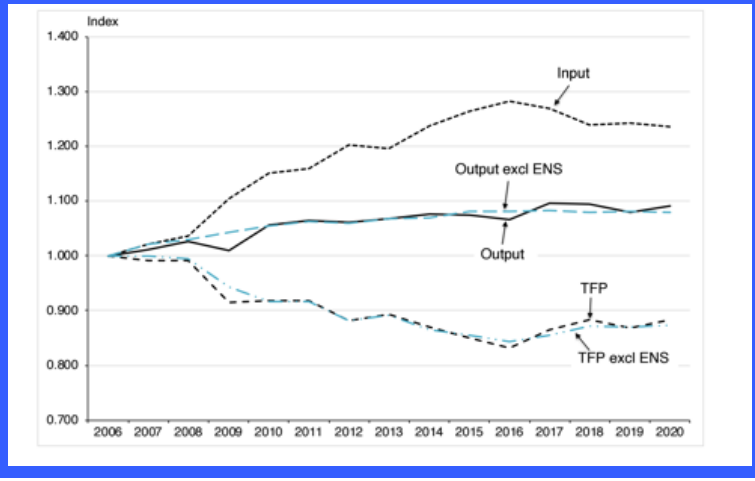


Chart source: Economic Insights 2021

Excess profits for what? Supernormal profits unrelated to productivity (2/2)

- Comparing AER network productivity with profit data reveals that supernormal profits are completely unrelated to relative productivity performance. Network businesses with low relative productivity are nevertheless capturing supernormal profits.

- In this chart, if our regulatory regime was effective, there would be a discernible relationship between relative productivity (x-axis) and returns to equity (y-axis) where, as productivity increases (moves to right), returns would move upwards. This would show the data points aligned with a trend line indicated by the purple arrow. Yet instead, we see a distribution with no discernable relationship. There is a substantial set of observations where supernormal profits alongside relative productivity is 20% to 40% short of that achieved by the most productive networks.

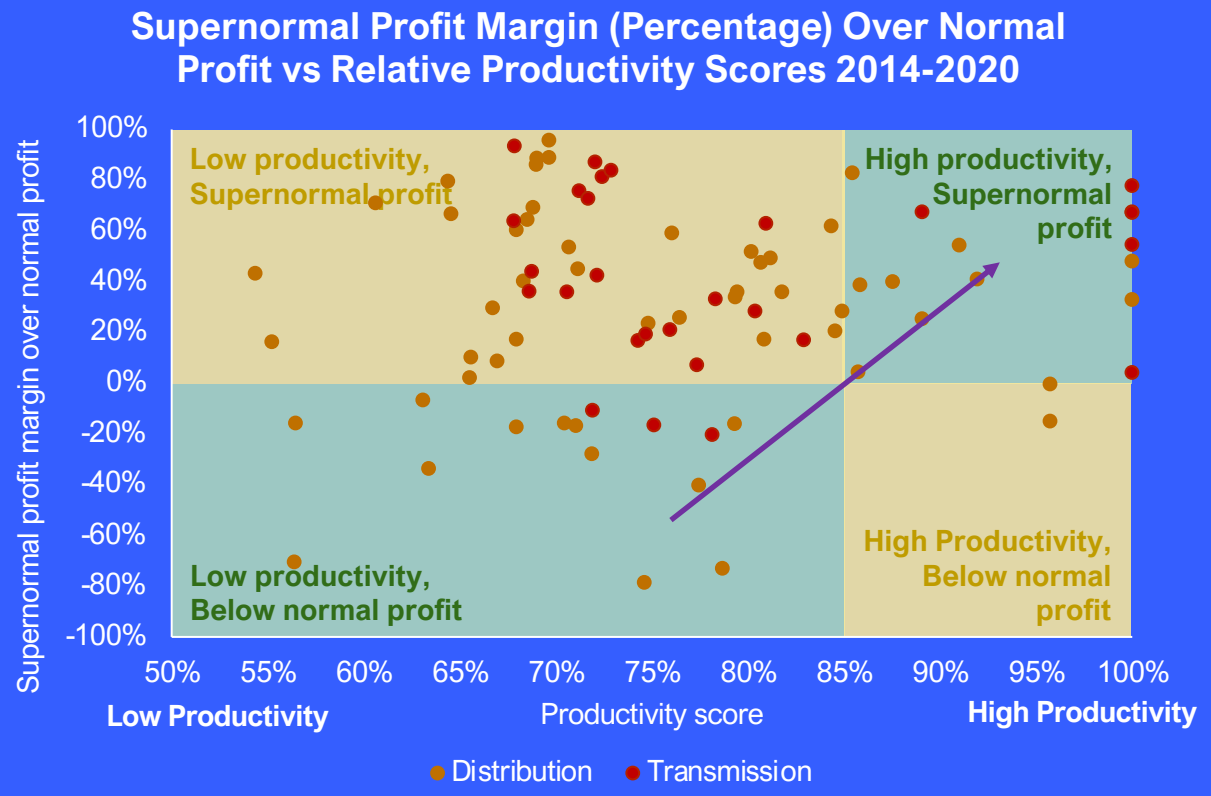


Chart source: AER 2022 data, Economic Insights 2021 data, IEEFA analysis

The need to decarbonise energy makes this regulatory failure even more problematic

The need to decarbonise Australia's electricity supplies is likely to require new investment in high voltage transmission to support the development of wind and solar farms. These tend to be optimally located in areas outside of where our current major transmission corridors exist, originally located to exploit large coal fields and hydro resources.

The Australian Energy Market Operator's Integrated System Plan proposes a substantial expansion in regulated transmission investment to replace expected closures in coal-fired generators and decarbonise electricity supplies as well as cater to an expansion in electricity demand associated with the uptake of electric vehicles.

Related to this NSW, Queensland and Victorian State Governments have announced their intention to invest in new non-regulated transmission to create Renewable Energy Zones that would allow for an expansion in the use of wind and solar capacity. Meanwhile the Federal Government has promised to establish a Rewiring the Nation Corporation with $20 billion in funding to provide finance to support new transmission and possibly other grid reinforcement investments like batteries.

If current supernormal profits continued into the future, then the total cost to consumers of equity financing for a regulated investment over a typical 50-year asset life would be 42.8% higher than the efficient cost. Excess regulated returns, alongside de facto monopolies, are also delaying and distorting investment in non-regulated transmission necessary to connect individual generation assets to the shared grid.

In addition, advancements in solar, batteries and smart internet-based appliance controls offer the potential to provide a cheaper alternative to investment in the lower voltage distribution network, while also enhancing competition in the wholesale generation market and assisting in decarbonising electricity supply. However, regulatory failure is increasing the risk and may be deterring investment in these emergent markets.

The energy transformation creates opportunities to bypass some traditional monopoly services. However, the potential for supernormal profits to distort efficient bypass has so far not been recognised in decisions by the major Australian energy market bodies.

How do we fix this? (1/3)

- The most obvious and immediate step to bring down costs is to **adjust the manner in which the regulator determines the cost of debt capital used to finance network assets (RABs)**. At present the regulator applies a highly theoretical model for how it assesses networks' debt financing costs that bears little relationship to the low level of revenue risk these businesses face and their actual debt financing costs. The model needs to be urgently adjusted to better reflect these businesses' actual debt financing costs.
- However, the fact that our national regulatory regime established in 2005 seems to have been incapable of addressing a long-running, pervasive and obvious bias that favours network shareholders over consumers suggest a deeper structural malaise. It is especially concerning that the AER, the ACCC and Energy Consumers Australia have yet to acknowledge the **urgent need to address the ongoing persistent supernormal profits** that, in IEEFA's view, appear inconsistent with any reasonable interpretation of the National Electricity Law governing network regulation.
- Since regulation of electricity networks' revenues was moved from state government-based authorities to a national regime from 2005, sector-wide productivity has declined, investment growth has exceeded demand growth and yet networks extracted persistent supernormal profits approaching 11% above actual costs between 2014 and 2021.
- As highlighted by Mountain (2019) this move to a national regime diluted and blurred control and accountability for electricity network costs and reliability across state and federal governments. Under the earlier state-based regime, there was a very clear line of responsibility to individual state government energy ministers for the cost and reliability of their state's electricity networks. This accountability was especially clear for those state governments that also owned their electricity network businesses. They had limited ability to shift blame.
- The move to a national regime created a situation where accountability became not only blurred between an individual state and the federal government-funded economic regulator. The national regime also reduced the ability for each jurisdictional parliament to monitor performance, via performance reports from their Auditors-General.

How do we fix this? (2/3)

- Regulating electricity networks' revenue is a challenging task where the regulator is almost always at an information disadvantage. Networks have successfully challenged regulator decisions seeking to reduce supernormal profits, through review processes.
- The lack of a clear outcomes-based metric for measuring the performance of network regulation, alongside a lack of transparency regarding the extent and scale of supernormal profits, is a key source of failure.
- Network companies can dedicate considerable resources and organise to influence decisions and appeal to authorities more effectively than consumers.
- Network companies, including those in the public sector, can reward equity shareholders via supernormal profits, whereas there are no corresponding rewards for regulators or consumer representatives seeking to constrain excessive supernormal profits.
- The lopsided pressure in favour of networks remains overwhelming and the establishment of the government-funded Energy Consumers Australia has not rectified this.
- In an environment where control and accountability by NEL energy ministers is unclear, and the regulator is not required to report on its effectiveness under the NEL or Commonwealth law, network businesses have successfully prevailed over attempts by the Australian Energy Market Commission (AEMC) and the AER to constrain network monopoly pricing power.
- Extra resourcing of the regulatory authorities on its own will not fix this structural bias favouring network shareholders over consumers.

How do we fix this? (3/3)
A commission is required

The Federal Government should **establish an independent commission of inquiry** to assess how to restructure energy network regulation (inclusive of gas pipelines) to achieve better value for money for consumers. This report recommends an independent commission address the following:

1 **Introduce effective reporting and monitoring arrangements**

- **Implement annual public performance reporting** led by state and federal governments' Auditor-Generals to independently assess how well the AER and AEMC are performing in achieving value for money for consumers. As part of this program, regulated networks should be required to provide economic profit reports, and the AER should consolidate and compare these in annual reporting to evaluate whether value for money is being achieved.

2 **Institute a comprehensive set of changes to the National Electricity Law**

- The National Electricity Laws require more clarity around what is a reasonable return for equity shareholders.
- The administrative rules and process guiding how the AER sets returns to capital need to be reformed to **move away from reliance on theoretical models** towards use of empirical data and error correction methodologies. The design and operation of incentive schemes and the estimation of cost building blocks should be improved to prevent cost overestimation and, therefore, supernormal profits.
- Consideration should be given to **introducing safeguards into the National Electricity Law**, whereby persistent economic profits outside a reasonable range must be returned to consumers.

3 **Improve the effectiveness of consumer representation**

4 **Ensure frameworks for future investment are efficient**

- The Federal Government's Rewiring the Nation policy and jurisdictional schemes should be reviewed in the context of supernormal profits, to ensure frameworks to facilitate future regulated and non-regulated network investment are effective.
- The commission could seek to **minimise the scope for monopoly network businesses** to leverage their monopolies in potentially contestable energy services, including both regulated and non-regulated transmission and emergent markets that substitute network capacity, including consumer energy resources such as distributed generation and storage.

Thank you

Simon Orme

Read the report: Regulated Electricity Network Prices Are Higher than Necessary

ieefa.org/

Institute for Energy Economics and Financial Analysis

Snapshot of IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) is a non-profit global impact think tank that produces a significant volume of original independent public interest research and analyses on issues related to sustainable energy markets, trends, regulations, and policies.

Intellectual leadership

We produce cutting-edge, solutions-focused analyses. We don't just highlight the problems – we offer ways to resolve the issues and roadblocks that stand in the way of a zero-emissions future.

Independence

We are an independent non-profit think tank. Our analyses are thoroughly researched, fact-based, and data driven. Our work is free from political influence, corporate and sectoral interests.

Nimble

We act on signals across the energy and finance spectrums in Australia and worldwide. Our analyses are timely and relevant. We can learn, adapt, and move quickly.

Trust

IEEFA is a trusted voice on issues related to sustainable energy markets, trends, regulations, and policies.

Impact

Our work makes a positive impact in the world. We aim to accelerate the energy transition to help achieve a cleaner future for humankind and the planet.

Snapshot of IEEFA