Institute for Energy Economics and Financial Analysis

The case for reforming the economic regulation of distribution networks in Australia in a high DER world

Ensuring distribution networks support rapid decarbonisation at efficient cost

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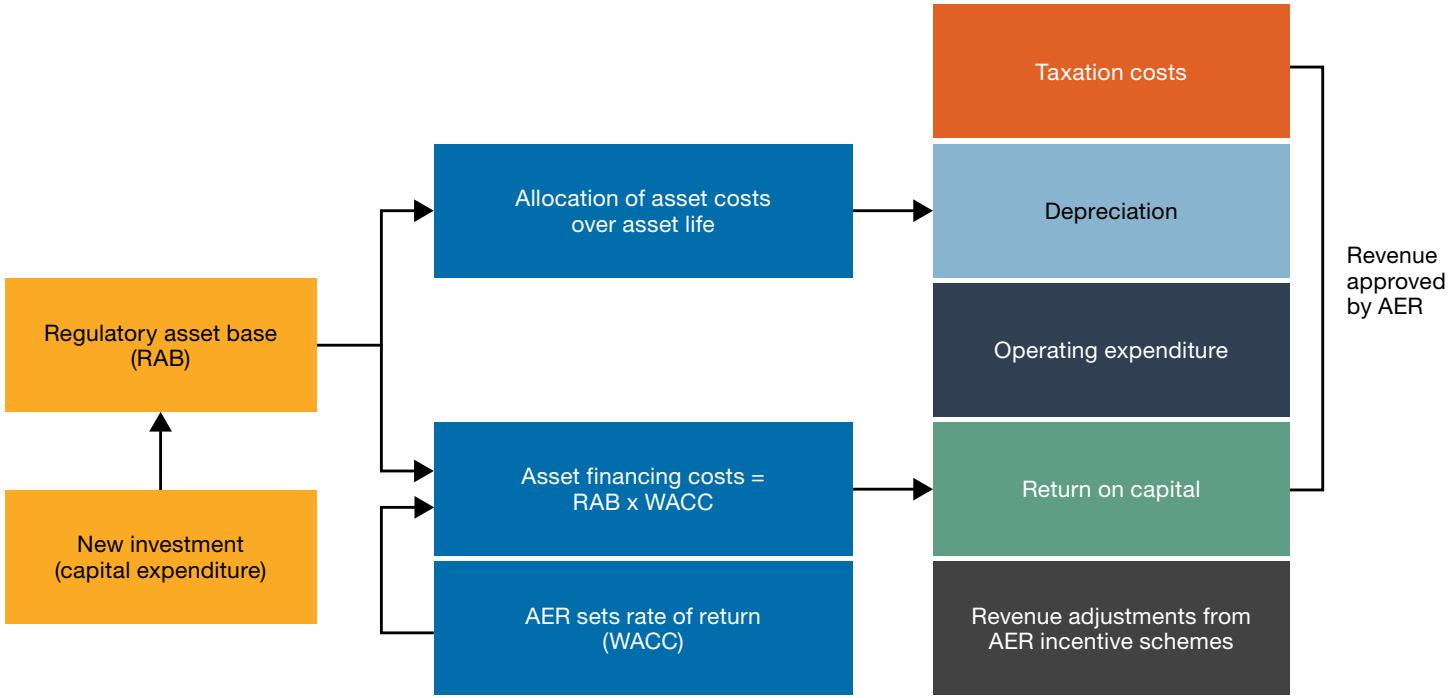
May 2024

Existing building block regulation dates from ‘80s

Figure 4.4 Forecasting electricity network revenues



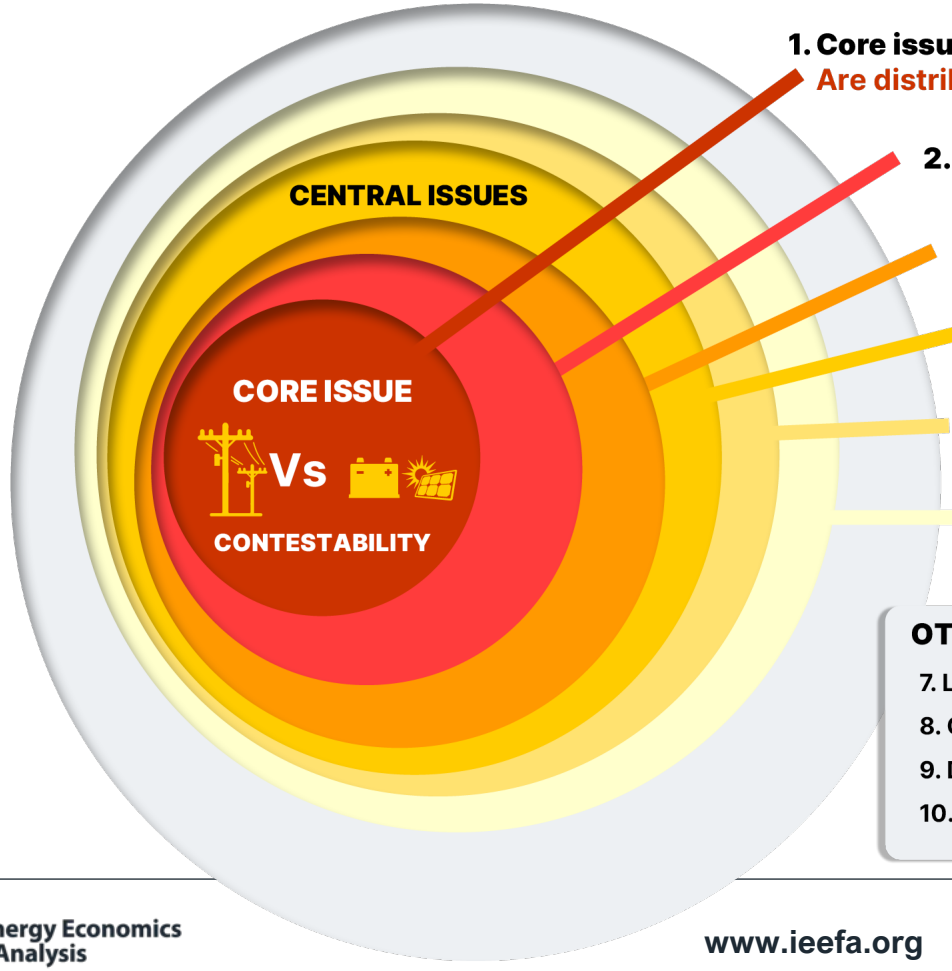
Note: AER: Australian Energy Regulator; RAB: regulatory asset base; WACC: weighted average cost of capital.

Revenue adjustments from incentive schemes encourage network service providers to efficiently manage their operating and capital expenditure, improve services provision to customers and adopt demand management schemes that avoid or delay unnecessary investment.

Source: AER.

10 reasons for a Productivity Commission review

Ten issues with the economic regulation of distribution networks



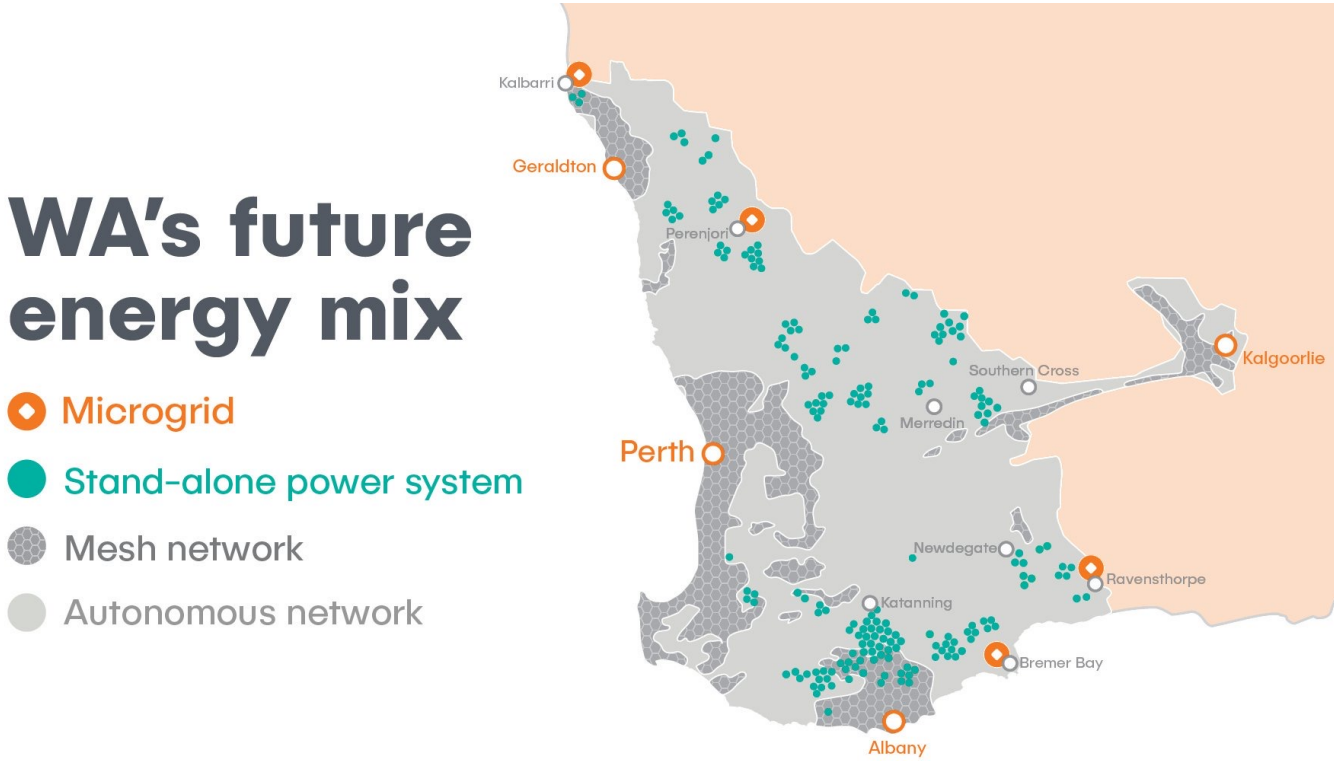
1. Core issue
   Are distribution networks still a monopoly?
2. Capex bias
3. Risk of over-investment
4. Supernormal profits
5. Emissions reductions and resilience
6. Lack of innovation support

OTHER ISSUES

7. Lack of genuine cost-reflective network pricing
8. Only reputational and bespoke incentives for DER
9. Differences in RAB by public vs private ownership
10. Regulatory burden

1. Core issue: Contestability

1.a Regional, remote and last mile contestability – applies to much of Australia

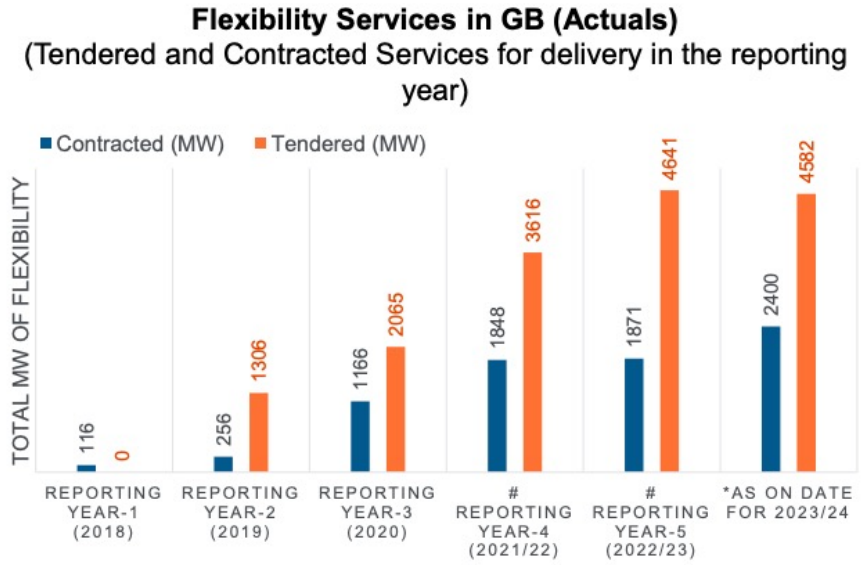


Source: Western Power

1. Core issue: Contestability

1.b Coordinated DER can defer or substitute for capex – augmentation/replacement

2017 Imperial/Carbon Trust research:
Flexibility markets to save UK grid up to **£40bn by 2050**



* Contracted/Tendered to date, more expected over the remainder of 2023
# Reporting cycle moved from calendar year to regulatory year

Source: ENA (UK)

These are usually imports or exports on demand to assist with constraints, but also includes restoration support

Example of flexibility services requirements from Electricity Northwest:

Service parameters	SUSTAIN	SECURE	DYNAMIC	RESTORE
Minimum declarable capacity	50kW	50kW	50kW	50kW
Minimum utilisation	30 mins	30 mins	30 mins	30 mins
Utilisation notification period	Scheduled in advance	1 week in advance	Real time	Real time
Maximum ramping period	N/A	<15 mins	<2 mins	<2 mins
Availability agreement period	N/A	Contract stage	Contract stage	Contract stage
When required?	Scheduled forecast overload	Pre-fault / peak shaving	Network abnormality / planned outage	Network abnormality
Risk to network	Low	Medium	High	High
Utilisation certainty	High	High	Low	Low
Frequency of use	High	Medium	Low	Low

Consumers may be able to earn more revenue from their DER

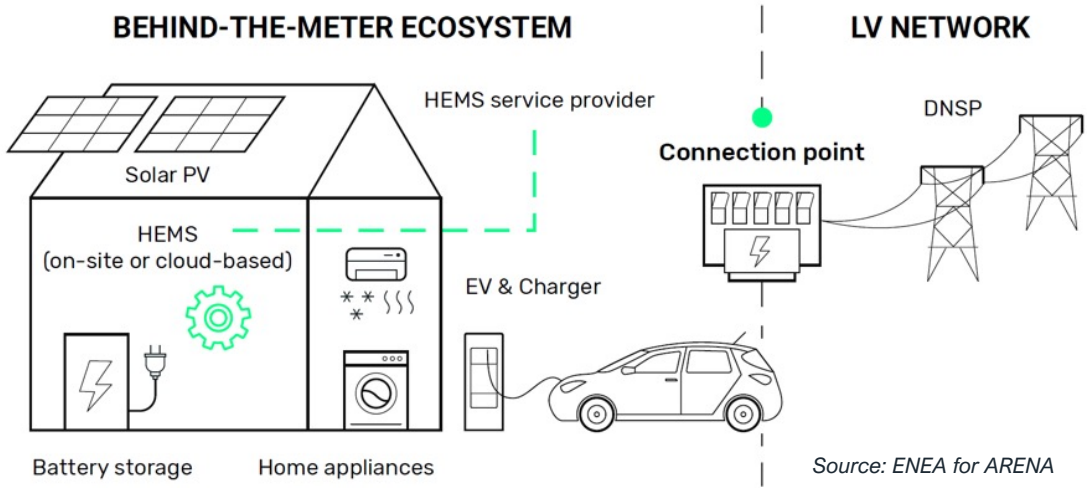
In Great Britain, about 20% of the country is in a constraint zone and local network flexibility is procured individually by each of the six distribution networks, and providers can earn up to £33/kW/yr in some locations.

Indicative revenue for flexible residential assets

Asset	Rated Power	Flexible Power	Annual Revenue @ £33/kW/yr
EV charging	7	2.2	£73
Home battery	5	5	£166
Home battery	10	10	£331
Electric heating	3	2	£66

Note that DNO flex revenue varies substantially location to location, and is only available in the ~20% of country with an active constraint.

Source: Axel

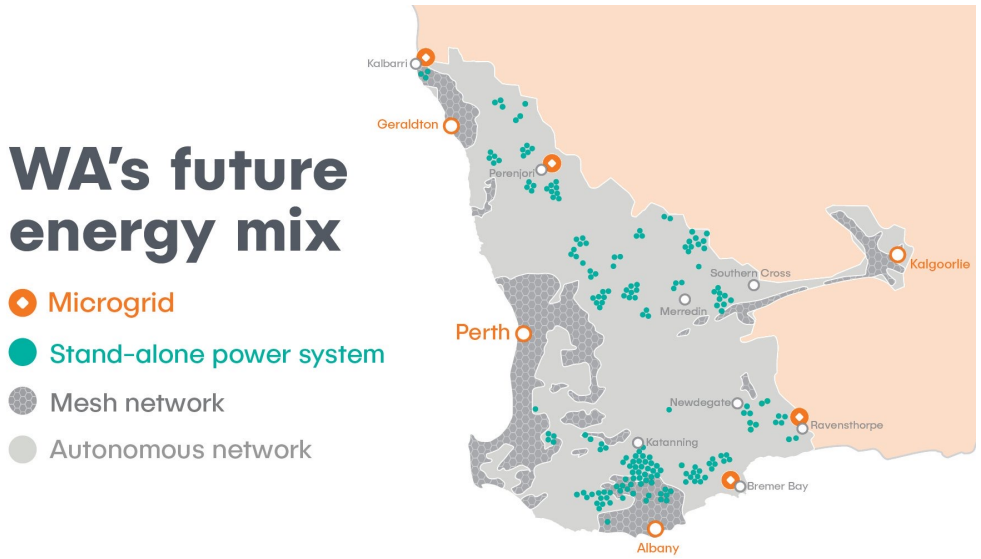


Source: ENEA for ARENA

According to flexibility software platform provider Axle, 'smaller flexible distributed assets like EV charging, batteries, and electric heating are best suited to participate. EV charging constitutes the bulk of existing DNO [Distribution Network Operator] flex supply'.

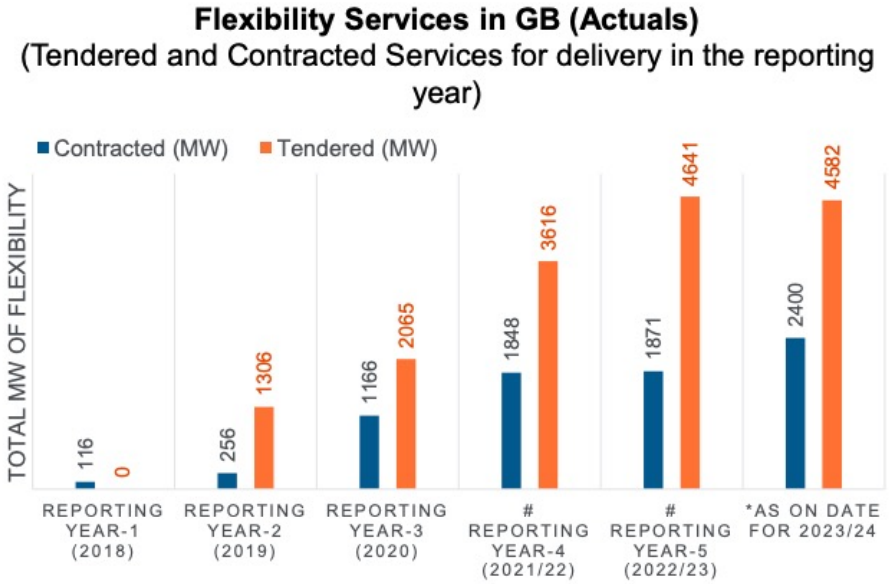
1. Two use cases for contestability

Remote and last mile contestability



Source: Western Power

Defer or substitute for capex – augmentation/replacement



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\# Reporting cycle moved from calendar year to regulatory year

Source: ENA (UK)

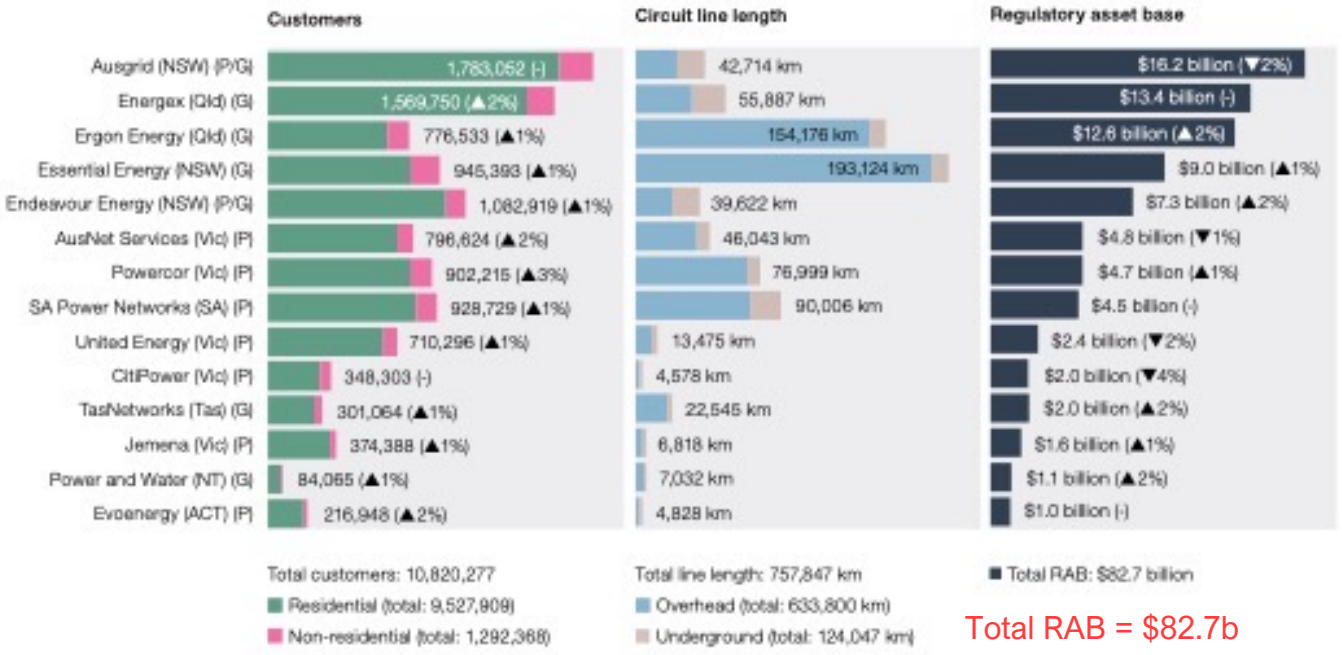
Are distribution networks still monopoly infrastructure?

2. Capex bias

Issues include:

- Differences in certainty of cost recovery of capex and opex (where AER can re-assess every 5 years)
- Capex returns based on RAB (cumulative) cf opex current basis
- Lack of DMIS expenditure ($3.2m out of $1b avail. 2017-2022)

Figure 4.3 Electricity networks regulated by the AER – distribution



Total RAB = $82.7b

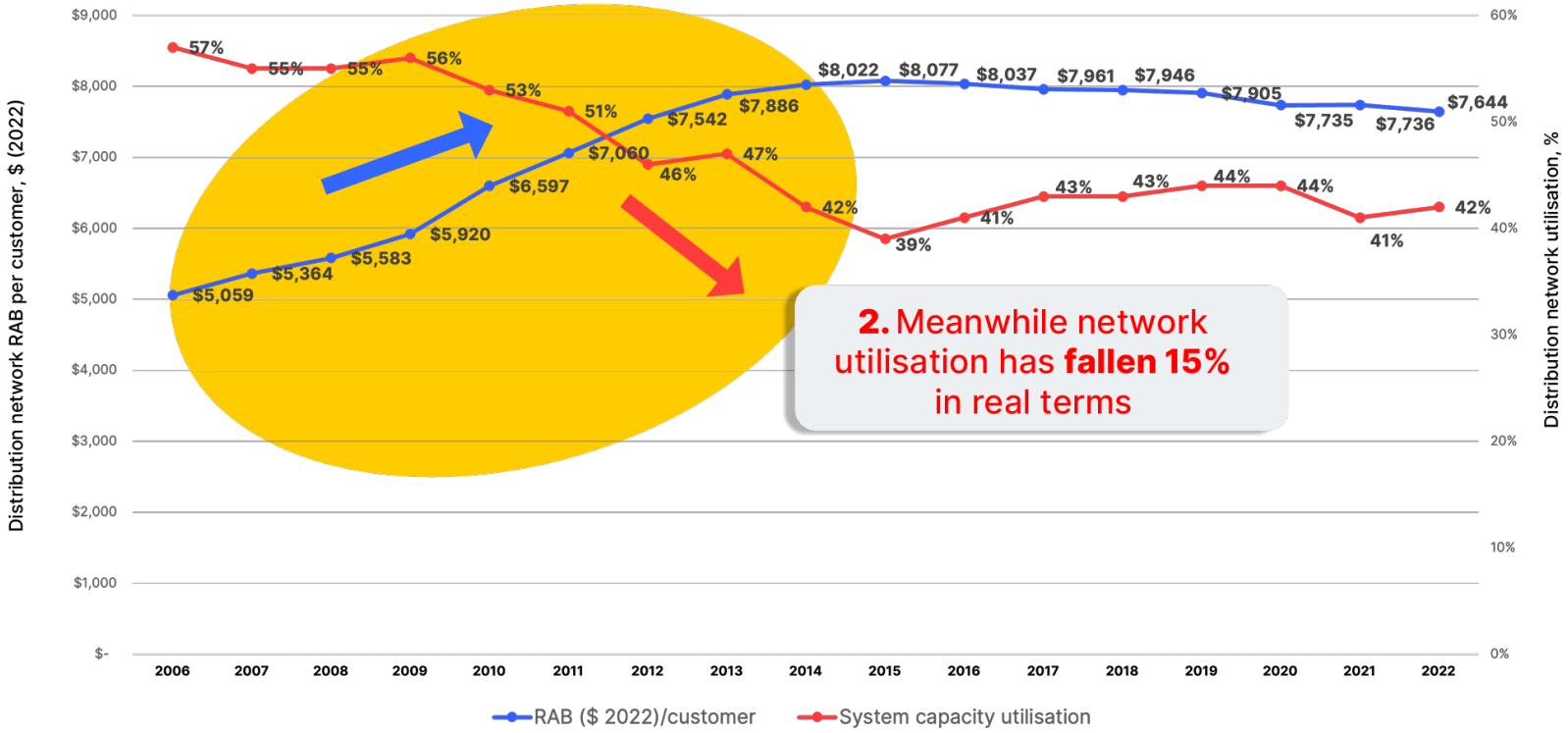
Note: (G): state government owned; (P): privately owned; GWh: gigawatt hours; km: kilometres; % values represent change from previous year.
Regulatory asset base is adjusted to June 2022 dollars. Line length and regulatory asset base are as at 30 June 2022 (31 March 2022 for AusNet Services transmission). Electricity transmitted is for the year to 30 June 2022 (year to 31 March 2022 for AusNet Services). Customer numbers, line length and asset base are as at 30 June 2022 for the distribution networks. For regulatory purposes, Northern Territory transmission assets are treated as part of the distribution system. Energy delivered is a measure of total energy transported through the transmission networks. The information reported includes energy delivered to distribution networks, pumping stations and directly connected end users. Energy delivered to other transmission networks is included in the data for individual transmission network but has been excluded from the total.

Source: AER revenue determinations and economic benchmarking regulatory information notices (RINs).

Source: AER

Distribution network RABs vs utilisation

1. Overinvestment led to a **60% increase** in the RAB per consumer in 2006-15 which hasn't been corrected



2. Meanwhile network utilisation has **fallen 15%** in real terms

The result of these two factors is that **consumers are paying more than they did in 2006 for infrastructure that they use less**

3. The risk of repeating the 2007-2014 over-investment

Consultant Matt Rennie:

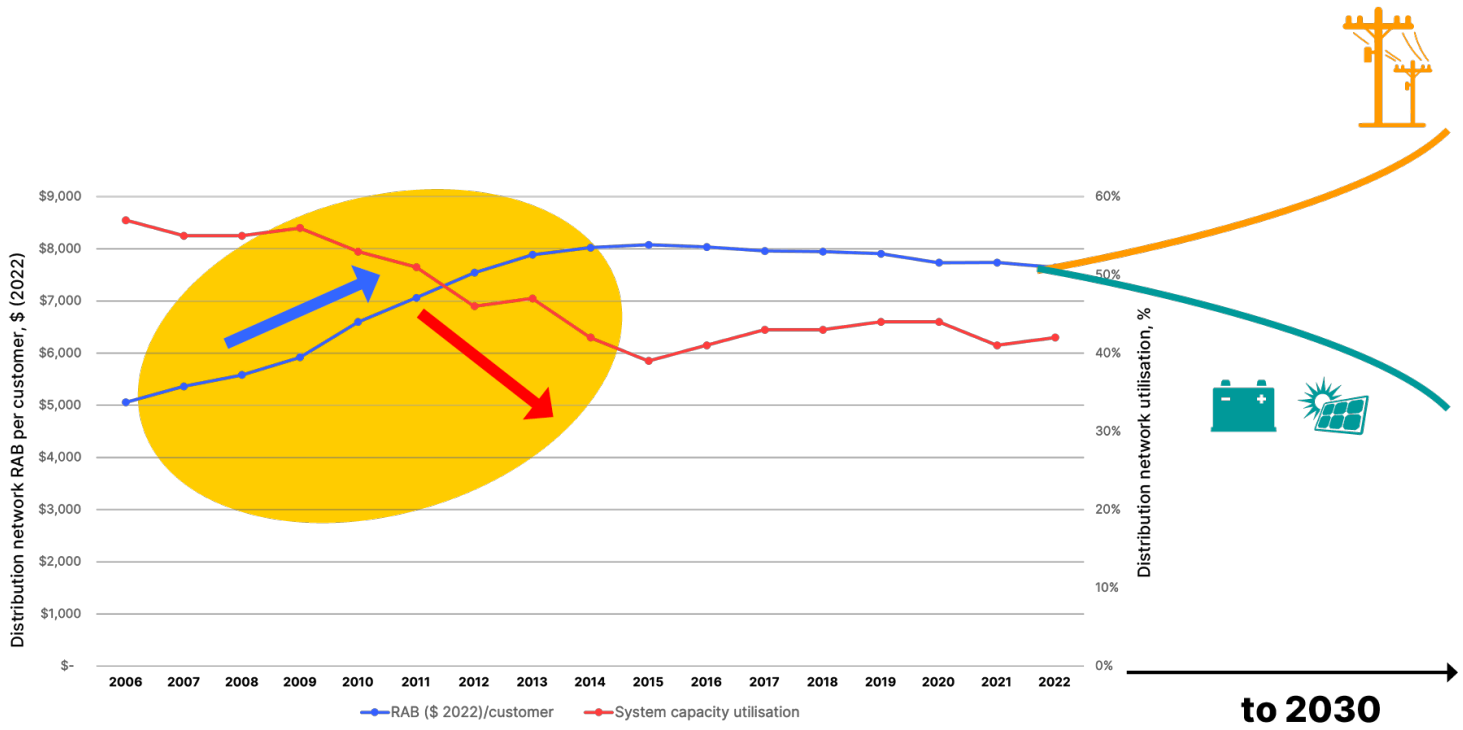
'The next 15 years will rival the N-1 period between 2004 and 2012 in terms of required network investment to handle household EVs and DER and retrofitted batteries in the zone and poletop transformer ecosystem, and the large scale network strength to handle the serious MW required for inset C&I charging.'

Queensland and SA DNSPs submitted 2025-30 revenue proposals to the AER in Jan 2024.
All have over 45% of households with rooftop solar – and a growing number with batteries:

- SA Power Networks: **21%** increase in capex (incl. $506m network augmentation)
- Ergon: **20%** increase in capex
- Energex: **22%** increase in capex
  (all cf 2020-25 granted revenue)

Future costs depend on economic regulation

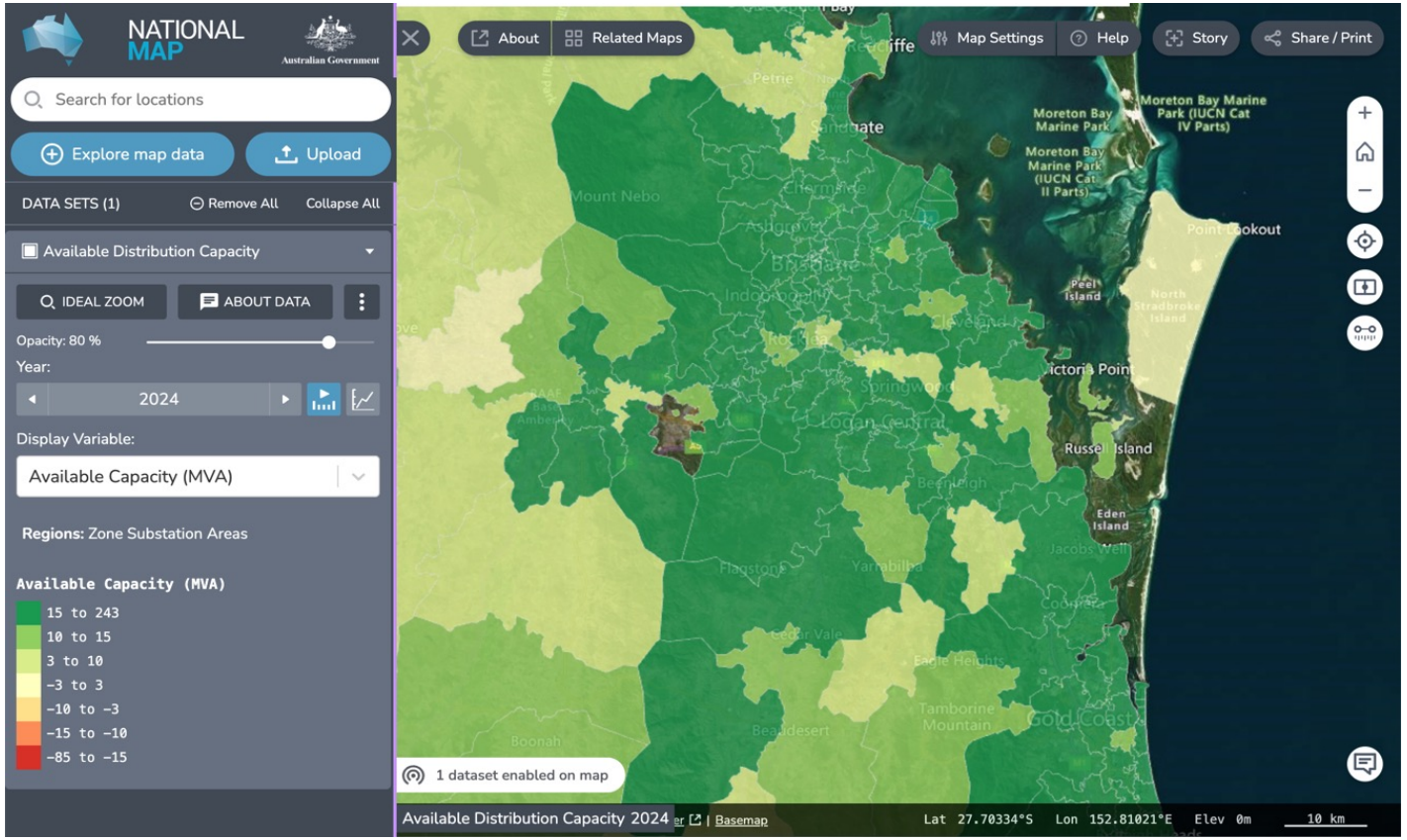
There is an urgent need to review economic regulation of distribution networks to avoid overinvestment and support decarbonisation



There is a high risk that this will happen again as three networks are currently asking for **20%+ increases** in capex for 2025-2030

Instead, the use of DER for network services, as well as smart integration of DER could reduce the need for network upgrades and decrease costs for consumers

Few network constraints currently



Source: Australian Government

Scanning these maps for the NEM, only the only regions with multiple orange or red zones, that is, more than 10MVA of constrained capacity are parts of Adelaide, Melbourne and regional Victoria

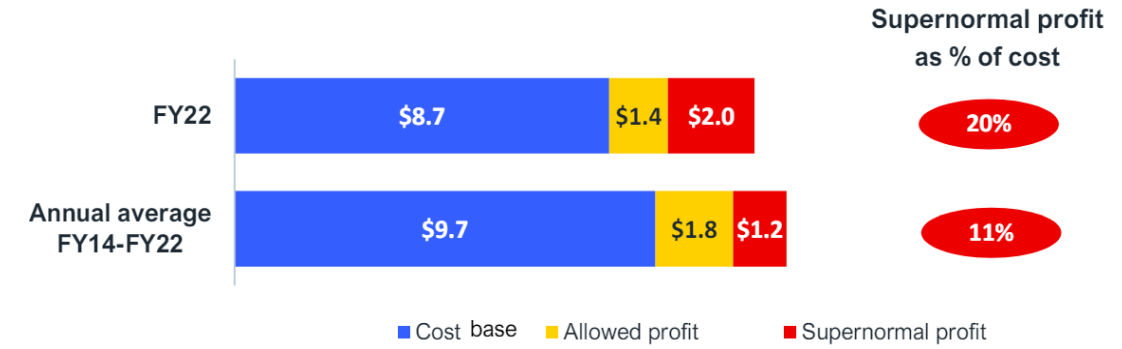
4. Supernormal profits

IEEFA prior analysis:

from FY14-FY22, $11 billion of supernormal profit was extracted in total across all networks (transmission and distribution), on top of the allowed profit of $16 billion or 11% of total cost.

- Issue about the implementation of the existing regulation
- Nevertheless, it provides a red flag that the system is not currently working in consumers' interests and preventing future supernormal profits should be a goal of any regulatory reform.

Figure 1: Network cost and profit outcomes annual ($ billion real)



Source: IEEFA analysis based on AER data. Note: Supernormal profit as % of cost is calculated as supernormal profit over the cost base plus the allowed profit.

5. Economic regulation has not been updated for emissions reductions

While the AEMC and AER have issued guidance on amended National Energy Objectives, they have not considered changing the economic regulation of electricity networks as a result.

IEEFA would suggest that given there is a legislated national emissions target of 42% by 2030 and a national policy of 82% renewables by 2030 as core to achieving that target, the economic regulation needs to be reviewed to ensure it supports the meeting of these targets.

While reviewing for emissions reduction, it would also be appropriate to assess the ability of the regulation to support appropriate resilience expenditure by networks.

6. Lack of regulatory support for innovation

2017 KPMG Review, factors that **could inhibit innovation and transformation** included:

- the fact that the current framework has been designed for a steady state, compared with the current uncertain and dynamic rate of change,
- the long (5 year) regulatory period,
- the staggered timing of regulatory reviews,
- the propose-respond model and its limitations on the regulator's role,
- the lack of flexibility of the regulatory framework, and
- the lack of incentive to innovate.

2017 KPMG Review, common characteristics to **encourage flexibility and innovation**:

1. A range of approaches are required – **incentive schemes alone cannot address the innovation challenge**
2. A clear vision of the role of network service providers in the new energy system
3. Additional, temporary incentives may be necessary to facilitate transformation
4. Incentives should straightforward - not be too complicated or administratively burdensome
5. Consumers should have an increased say, and
6. Greater flexibility is likely to be required for both the regulator and the business given the pace of change.

Report also covers

Other issues discussed in less detail in this report are:

7. a lack of genuine cost-reflective network pricing.
8. reputational and bespoke incentives for DER exports are insufficient to address the DER integration challenges
9. differences in RABs and revenues between government-owned and privatised distributors, and
10. a high practical and cost burden of the regulation.

And international trends:

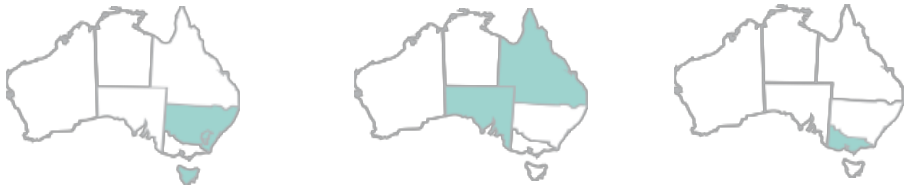
- totex regulation
- flexibility procurement (DER providing network services)
- performance incentives

Urgency

Baringa warns that changes are needed soon:

> *"because after certain expenditure on network upgrades are incurred, or after certain solar PV is curtailed in a particular year, these impacts cannot be reversed even if they were avoidable if reforms to more efficiently integrate DER had taken place earlier."*

DNSP Regulatory Resets



FY25-FY30 FY26-FY31 FY27-FY32

Recommendation:
A first principles Productivity Commission Review

We recommend the review look to develop a form of economic regulation of distribution networks to achieve the following outcomes:

1. The best outcomes for consumers in terms of the lowest possible prices
2. Economically efficient outcomes for our economy, including the end of the bias to spend capex
3. Fast decarbonisation, including electrification to achieve Australia's legislated emissions reduction goal which is now part of the National Electricity Objective (NEO) under the National Electricity Law
4. Creating a level-playing field between infrastructure and DER-provided network services, and
5. Improved climate resilience.

Questions that could be asked

1. What is the nature of contestability in distribution network services?
2. What outcomes should distribution networks be remunerated to provide?
3. How can and should distribution networks be rewarded for accelerating decarbonisation?
4. How can and should distribution networks be rewarded for innovation? Including within and outside economic regulation.
5. What processes can be used to efficiently determine network revenue in what timeframe given the fast-paced nature of the energy transition?
6. How can supernormal profits be avoided?
7. Should performance monitoring of network regulation and the regulator be introduced and if so, what form should this take?

Thank you!

IEEFA Guest Contributor

Dr Gabrielle Kuiper

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