A Report for

EUAA
ENERGY USERS ASSOCIATION
OF AUSTRALIA

Australia's Rising Electricity Prices and Declining Productivity: the Contribution of its Electricity Distributors

The Energy Users Association of Australia (EUAA)

The EUAA is the national association of energy users – electricity and gas. It is a non-profit organisation funded by membership fees, internally generated revenue and external funds. It is focused entirely on energy issues and was formed in 1996. Members determine EUAA policy and direction, and elect a Board. The Association members are predominantly business users of energy with activities across all states and many sectors of the economy.

Our activities cover national and state issues dealing with electricity and gas, as well as climate change and energy efficiency. A range of member services are provided including information about energy prices, market conditions, green markets and standard electricity contracts.

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Australia's rising prices and declining productivity: the contribution of its electricity distributors

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FOREWORD

Australia's electricity sector has been through some significant reforms over the last 30 years. In the 1990s structural reform of electricity supply was implemented and assets were privatised in Victoria and later South Australia. Structural reforms included the separation of electricity networks used to transport electricity from its point of production to its point of end use, from other parts of the supply chain. As these networks are natural monopolies, they were also subject to economic regulation intended to deliver efficient outcomes. The most recent developments have been the centralisation of economic regulation of electricity networks by the Australian Energy Regulator, and the development of detailed rules that the regulator is required to follow in such regulation.

These reforms promised higher efficiency and productivity, lower prices and better services. They have delivered the opposite. Ballooning expenditure has meant that prices charged by government-owned distributors have more than doubled over 10 years with significant further increases to come in the next four years. Under the regulatory formulation this has delivered growing profits to these businesses. The state governments that own distributors have enjoyed big and rising dividends and income taxes from these rising profits. But soaring electricity prices have now become politically significant. The tide has started to turn and the Australian community of household and business electricity consumers is demanding explanations.

Rising prices have been argued to be a response to demand growth, ageing assets and historic underinvestment. But the research in this paper concludes that there is more to it than this. In response to electricity users' concerns, the Energy Users Association of Australia (EUAA) has commissioned this research to assess the real reasons for the price increases and productivity decline, and to suggest how these serious problems should be resolved. This report compares outcomes delivered by distributors in New South Wales, Queensland, Victoria and South Australia. It builds on and confirms influential research by Professor Stephen Littlechild and Bruce Mountain published in May 2010 that pointed to government ownership, the regulatory framework and the conduct of regulation as the main causes of rising prices and declining productivity.

I commend this report to policy makers, regulators, industry participants, and last but not least to electricity consumers who, when all has been said and done, are bearing the consequences of what appears to be significant policy and regulatory problems. The time has come for tough reforms that will deliver efficient electricity networks that serve the interests of the broader Australian community.

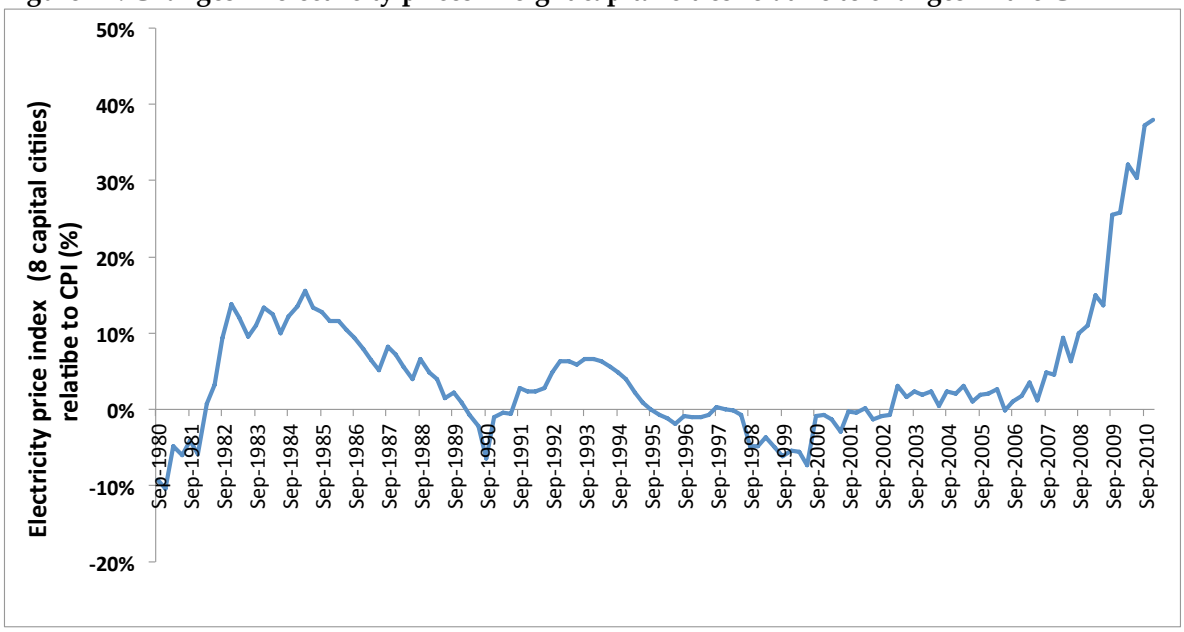
Finally I would like to thank the main author, Bruce Mountain and acknowledge the considerable assistance of EUAA staff in undertaking research for this report, and in its production, particularly our Analyst Nathan Donnelly.

Roman Domanski, Executive Director,
Energy Users Association of Australia, May 2011

EXECUTIVE SUMMARY

The index of electricity prices in Australia has remained within a band of plus or minus 5% of the Consumer Price Index (CPI) for the 22 years between 1986 and 2008. But since then electricity prices have increased by 40% relative to CPI. [1] This is shown in Figure E1:

Figure E1. Changes in electricity prices in eight capital cities relative to changes in the CPI



Source: Australian Bureau of Statistics 6401.0, Table 7, CME analysis.

Whereas the average price of *producing* electricity has remained roughly constant over the last decade, in the period from 2001 to 2010, the average annual price of *distributing* it has increased by 3.5%[2] in constant currency. Following a series of decisions by the Australian Energy Regulator (AER) in 2009 and 2010, distributors' revenues in constant currency will increase on average by 7%[3] per annum for the next four years, roughly double the rate of the last 10 years.

Rising electricity prices has meant that the utility sector has played a major part in the deterioration in Australia's productivity over the past decade. From 2001 to 2010, the utilities sector (covering electricity, gas, water and waste water) had the greatest decline in multi factor productivity – about 3.7% per year – of all twelve industry sectors analysed by the Australian Bureau of Statistics[4]. Electricity is the largest element of this industry sector, and monopoly electricity distribution[5] is the largest component of the electricity industry. The Energy Users Association of Australia (EUAA), on behalf of its members, has

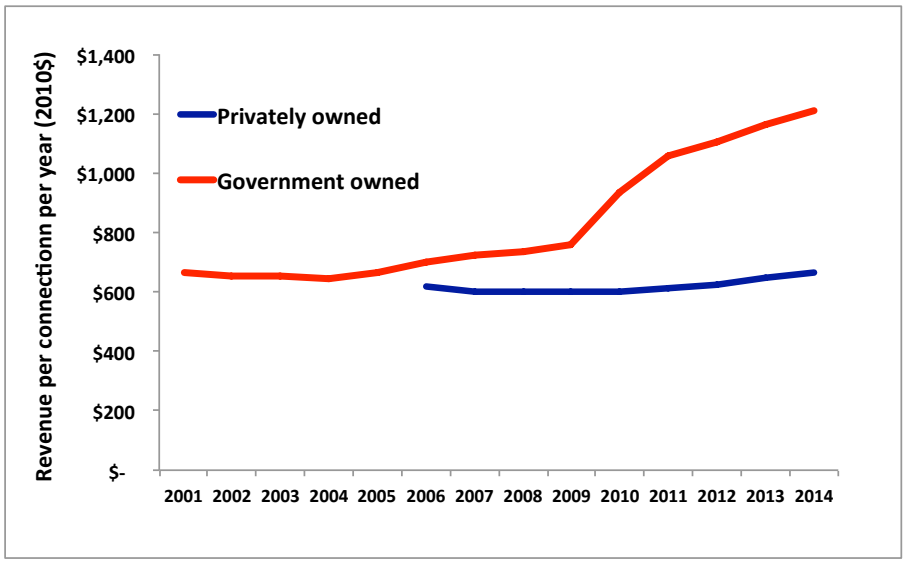
commissioned this report to investigate the reasons for this, and to provide some suggestions on what might be done about it.

This report extends earlier independent research[6] by examining the outcomes delivered by electricity distributors in New South Wales, Victoria, Queensland and South Australia[7]. The Australian Energy Regulator, some of the distributors and their representative associations suggest higher expenditure and consequently higher prices are attributable to demand growth, ageing assets, and historic underinvestment. This report critically examines these explanations. It then examines the role of ownership, regulatory design and regulatory practice. Finally, the report suggests policy and regulatory reforms that will raise productivity in this important part of Australia's energy industry.

Outcomes

Revenues collected by government owned distributors in New South Wales and Queensland have grown far faster than by privately owned distributors in Victoria and South Australia as shown in Figure E2. The biggest increases have occurred after the AER's regulatory decisions in 2009 and 2010.

Figure E2. Revenue per connection from government owned and privately owned distributors



The main reason for this is higher charges for depreciation and return on assets based on the regulated asset base. In 2007 the regulated assets of government owned distributors were around 30% higher per customer than privately owned distributors. By 2014, just seven years later, the regulated assets of government owned distributors will be around 200% greater per connection than for privately owned distributors.

The regulated asset base is growing much more quickly for government owned distributors because their capitalised expenditure is around four times higher per connection compared to their privately owned peers.

Efficiency benchmarking using regressions shows that government owned distributors are, on average, half as efficient as the privately owned distributors. In other words, their total expenditure would need to halve to reach the level of efficiency of the privately owned distributors. Bigger improvements would be needed for the least efficient distributors. Furthermore, comparison with the performance of electricity distributors in Britain suggests that Australian distributors are lagging behind: distributor revenues per connection are twice as high in Victoria, three times in South Australia and four times as high in Queensland and New South Wales.

Explanations

Why have costs risen so much, particularly by government owned distributors? The Australian Energy Regulator, some of the distributors and their representative associations suggest higher expenditure and consequently higher prices are attributable to demand growth, ageing assets, and historic underinvestment. The report suggests that there is more to it than this:

- Electrical demand has grown more strongly in Victoria than in Queensland and far more strongly than in New South Wales[8]. Yet growth-related expenditure allowed by the AER has been four times higher per connection for government owned distributors in New South Wales and Queensland than for privately owned distributors in Victoria and South Australia. This suggests the main issue seems to be an inefficient response to demand growth by government owned distributors, sanctioned by the regulator.
- On asset ageing, government owned distributors in New South Wales and Queensland have an effective average remaining life of 31 years. The private distributors claim 22 years effective average remaining life. If the replacement of ageing assets is an explanatory factor then it would be expected that privately owned distributors would be spending more to replace assets that are nearer the end of their lives. Yet the government owned distributors have been given regulatory allowances that result in them charging energy users four times more per connection to replace ageing assets, as the privately owned distributors. Again, this suggests the main issue is an inefficient response to asset ageing by government owned distributors and approved by the AER.

- On historic underinvestment, the New South Wales Government and the Energy Supply Association of Australia commissioned studies in the 1990s that concluded that NSW distributors were inefficient and their capital productivity was poor. This suggests historic over-investment, not under-investment, by NSW distributors. Since the time of this study expenditure by New South Wales distributors has consistently risen not fallen. In Queensland in 2004 the Independent Panel (otherwise known as the Somerville Review) concluded that under-investment explained poor service outcomes by Queensland distributors. But the service outcomes for Queensland's biggest distributor that serves three-quarters of Queensland's users were above the Australian average. For the other distributor, it is not clear that the problem was historic underinvestment rather than co-ordination and planning deficiencies following Government approved but apparently poorly executed mergers in the previous five years.

This report suggests that the big gap in the performance of government and private distributors can be explained by ownership, asset valuation, the allowed rates of return, regulatory design and implementation.

Ownership

Mountain and Littlechild (2010) suggested that a government that is also an investor, as the owner of a regulated company, and as the recipient of its tax revenues, has an additional (financial) interest in the profitability of that company. It is more receptive to a regulatory framework that continues to provide such revenue streams. It also has a financial interest in limiting the extent of regulatory power and discretion and how this is exercised, especially with respect to the severity of the price control.

If distributors are able to obtain profits above their cost of capital by expanding their regulated asset base, they can be expected to want to do this. Government-owned distributors have access to inexpensive capital through their state treasuries, and in addition these treasuries receive the dividends and the income tax on the profits that the distributors deliver. This provides a powerful incentive for government-owned distributors to favour an expansion of their regulated assets. Indeed, the NSW Treasury attributed the rapid growth in dividends and income tax from its distributors, to the rapid growth of their regulated assets.

Asset valuation

Governments that own distributors are likely to wish to value their distributors' assets more highly since this increases profits, even if it does not increase the rate of return on equity. The governments of privatised distributors are likely to prefer lower asset

valuations since this reduces prices and the governments of privately owned distributors do not collect distributor dividends and taxes. The evidence suggests ownership has affected asset valuation: in 2014, regulated assets of government owned distributors will be valued a little under twice as highly per kilometre of line as those of privately owned distributors. There are many factors that will affect this disparity. For example, government owned distributors value land and easements in their regulated asset bases at $1.4bn. Their users are being charged around $700m over five years for the regulated return on these "assets". Private distributors in Victoria on the other hand attribute no such value to their easements, and hence make no claim on their customers for regulated returns on this.

Regulatory design

The regulatory arrangement is defined by a "propose-respond" doctrine in which the AER is required to assume that distributors have proposed efficient expenditure in their regulatory proposals. The onus of proof then rests with the AER to prove that they have not. The AER's task under the propose-respond doctrine is to review the evidence provided by the distributors, rather than to develop its own evidence or undertake its own review. If the AER agrees with the distributors' proposals it has no special obligation to explain why. On the other hand, if the AER wishes to disagree with the distributors' proposals it needs to justify this and provide the detail of the calculations it has performed to justify its own view.

The propose-respond doctrine assumes that distributors will provide expenditure forecasts that reflect efficient expenditure simply because they are told to do this. But the regulatory regime provides them with powerful incentives to overstate their requirements. It is naïve to imagine that the distributors would ignore these incentives in developing their regulatory proposals.

The propose-respond doctrine has encouraged the AER to adopt a forensic "bottom-up" approach to the assessment of expenditure proposed by the distributors. Considering the asymmetry in resources and expertise, this approach is inadequate in assessing the efficiency of around $50bn of expenditure by distributors who are well-resourced, possess all of the relevant information and are highly motivated to convince the AER to their views.

In addition, the arrangements to appeal AER decisions are undermining the AER's ability to set expenditure allowances that reflect efficient expenditure. This is partly because the appeal arrangements encourage cherry-picking (a distributor can appeal those parts of an AER decision that it does not like, while the rest of the decision that it does not like still

stands). Also the appeals arrangement is asymmetrical: the resource requirement needed to raise an appeal means that although end users may be legally entitled to appeal decisions, they are effectively unable to participate. This asymmetry combined with the opportunity to cherry-pick is likely to encourage the AER to err on the side of the distributors in their price control decisions, as a way to reduce the risk that its decisions will be appealed.

Regulatory implementation

While the AER's ability to constrain inefficient expenditure is limited by the propose-respond doctrine, the AER does have discretion to decide the weight it will place on different factors that it is required to have regard to in assessing distributors' claims.

One of the factors it is required to have regard to, is the benchmark efficient expenditure. The AER has chosen to limit the role of benchmarking to a "*top down test of more detailed bottom-up assessments*". In an international survey of the use of benchmarking in network economic regulation (Pollitt 2009, page 32) concluded that "*only a small number of regulators do not use or are not actively considering the use of advanced benchmarking techniques in analysing the efficiency of gas and electricity network companies*." Benchmarking provides the ability to use the power of comparison to identify inefficient businesses and to force them to improve. The AER's decision to not apply benchmarks in its efficiency assessments is likely to be a significant factor limiting its ability to constrain inefficient expenditure.

A second significant area is the allowed rate of return. The AER has set a higher allowed rate of return than the previous jurisdictional regulators had set in their regulatory decisions. The main reason for this is a debt risk premium that is around three times higher than the jurisdictional regulators had set. The debt risk premium is the premium on top of the risk free rate that compensates lenders for accepting the risk of default in their loans to distributors. The AER has recognised that the debt risk premium that it has set results in an allowance for debt costs that is higher than the actual cost of debt to distributors. This results in significantly higher prices. Nevertheless the AER contends that it would be contrary to the National Electricity Objective (the long term interest of consumers) for the debt risk premium to be based on a benchmark of distributors' actual debt costs, as for example the British regulator, Ofgem, does. The AER has provided no reasonable justification for rejecting of the use of actual debt cost information in its determination of the debt risk premium.

Suggested improvements

The analysis in this paper concludes that the problems that have led to wasteful expenditure by government owned distributors in particular, are deep-seated and complex. Simple explanations such as rising demand, ageing assets or historic underinvestment ignore these problems and therefore are not capable of addressing them.

The rewards from a thorough reform should be significant. For government owned distributors to catch up to their privately owned peers would mean cutting their expenditure in half. This would not have a significant effect on prices in the short term, since the backlog of past expenditure will still be weighing on consumers. But in the longer term, raising distributor efficiency will result in dramatic electricity price reductions.

If distributors in Australia achieved the investment and operational efficiency, per unit asset valuations and rates of return of British distributors, distributor prices will be around one quarter of their current levels in New South Wales and Queensland. Price reductions to end consumers in 2011 of around 39% in these states would be possible. In Victoria and South Australia, price reductions of around 29% would be possible. Furthermore, lest it be thought that the British distributors are being held up as an unreasonable benchmark, it should be noted that Ofgem, the British energy regulator, noted that British distributors are somewhat less efficient than comparable distributors in the United States of America.[9]

Major policy and regulatory reforms will be needed to improve the efficiency and productivity of the distribution sector in Australia. Most of the changes we suggest are not mutually exclusive. Considerable thought is needed to decide priorities.

Policy reforms

Privatise

The compelling evidence that privately owned networks in Victoria and South Australia have delivered superior outcomes for electricity users in those states should be considered carefully. Private ownership of the distributors in New South Wales and Queensland coupled with effective regulation will strengthen efficiency incentives and eliminate distortions attributable to these governments' financial interest in their distributors. The best interest of consumers should take precedence over ideology.

Review the "competitive neutrality" doctrine for regulated networks

The competitive neutrality doctrine was established to ensure that government-owned businesses serving competitive markets do not crowd out privately owned competitors, as a result of preferential access to capital or markets that government owned businesses may enjoy. But distributors are monopolies. They have no competitors and the threat of crowding out does not therefore arise. The application of the competitive neutrality doctrine to government owned distributors has meant that they have been allowed to charge their users a return on equity and debt as if they are privately owned. There is no good reason for this. It is resulting in inefficient over-investment, and windfall profits to state governments at the expense of electricity consumers.

Empower electricity users

End users are almost completely disempowered in the current regulatory process. Littlechild (2011) describes the role of the Federal Energy Regulatory Commission (FERC) in regulatory decisions of electricity and gas monopolies in America. Littlechild (2011, page 35) concludes:

> "*Settlement is now actively chosen by all parties – utility, customers, interstate and state regulators – in some 90% of all rate cases at FERC. It has been consistently preferred, in essentially its present form, over a period of at least 35 years, and in some form for about 45 years. This is a remarkable record of survival in an activity – utility regulation – that has been characterised by no little reform and change over the last half century.*"

Under the "settlement" process adopted by FERC, the role of the regulator is to facilitate negotiation and settlement between the utility, its consumers and other interested parties including state-based public utility commissions. FERC staff implement this role by providing analysis and proposed settlements, within a negotiation framework that leads to litigation if settlement can not be achieved. The adoption of a negotiated settlement approach that empowers users in regulatory processes merits serious consideration in Australia.

Consumers may become empowered in other ways, without fundamental changes to the regulatory design. Consumer representation at commissioner level in regulatory institutions should be considered. This may help to alleviate perceptions – real or imagined - that a government that owns regulated companies and receives its profits and tax revenues has a financial interest in limiting the extent of regulatory power and discretion through its regulatory appointments.

Consider the re-establishment of jurisdictional regulation

The AER's decisions have been significantly more favourable to the distributors than the decisions of the jurisdictional regulators. Some jurisdictional governments are projecting significantly higher dividends and income taxes as a result. The creation of the AER has provided the benefit to these jurisdictions of higher financial returns, and also the opportunity to deflect the blame for consequently higher prices.

The tempting conclusion to draw from this is that the solution would be to transfer regulatory authority back to jurisdictional regulators to re-establish accountabilities. However, the report concludes that other policy and regulatory solutions set out in this paper should be considered first. However, if meaningful progress is not achieved in these other areas, then re-establishing jurisdictional regulation of electricity distributors should be seriously considered.

Regulatory reforms

Reduce the allowed rate of return

Excessively high rates of return on regulated assets deliver windfall profits and stimulate inefficient over-investment. A particular issue is the cost of debt that the report suggests should reflect the benchmark cost of debt for regulated monopoly distributors, not the cost of debt of corporations that serve competitive markets. In addition, the cost of capital for government owned distributors should reflect their access to funding provided by state government treasuries.

Revalue assets

Regulated assets of distributors are valued much more highly in Australia than in Britain. Also the regulated assets of government owned distributors are valued much more highly than those of privately owned distributors in Australia. Re-establishing the value of Australian distributor assets at internationally comparable levels will deliver significant price reductions.

Review the propose-respond doctrine

The AER should control the price/revenue review process and be able to undertake whatever analysis it considers appropriate. It should be subject only to a general requirement to provide reasonable evidence and argument to support its decisions, and should be able to draw conclusions based on reasonable inferences about incentives and historic performance.

Institutionalise benchmarking

Expenditure efficiency benchmarking should become part of the regulatory methodology and should be used to set expenditure allowances for recurrent expenditure (whether it is capitalised or not). The application of this approach will force inefficient distributors to catch up to their more efficient peers. Changes to the National Electricity Rules are likely to be needed to ensure that benchmarking is accorded greater status than merely as one of several factors that the regulator may have regard to, as it sees fit. Ideally regulatory control periods should be made concurrent to enhance the application and construction of benchmarks and streamline the regulatory process.

Reform the appeal mechanism

The design of an appropriate appeal mechanism requires careful consideration. The interests of transparency and accountability need to be weighed against the need to ensure that the AER has discretion to take account of uncertain factors that affect efficient expenditure. At the least there should be limited or no opportunity to cherry-pick AER decisions. Appeal arrangements should be structured so that energy users should enjoy comparable access to appeals in practice, not just in principle, as regulated network service providers do.

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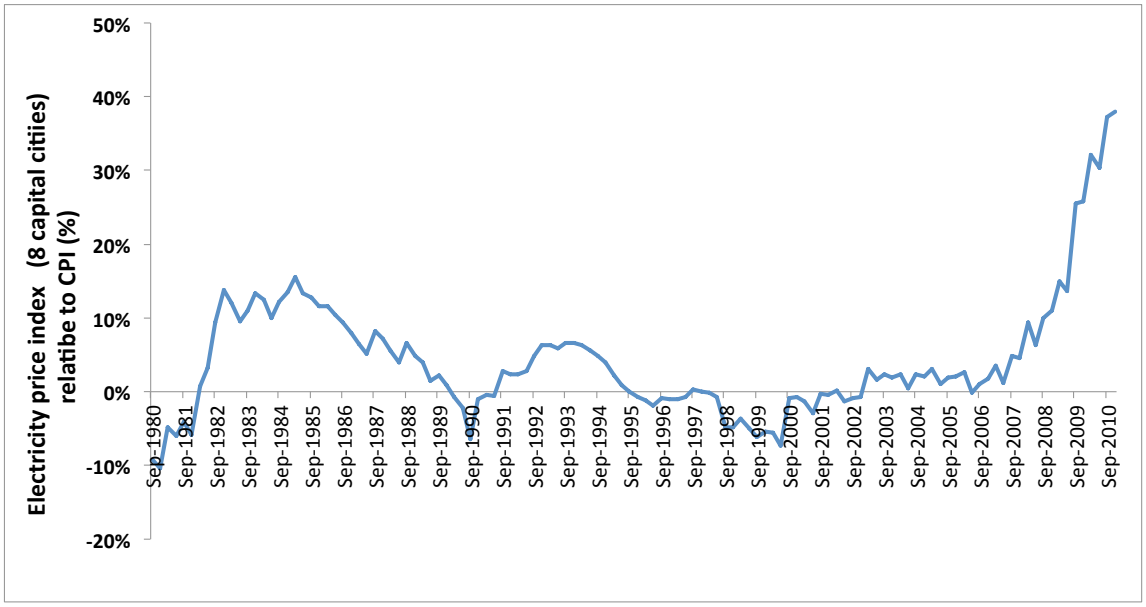
1 Why this report ?

'nothing contributes more (than productivity growth) to reduction of poverty, to increases in leisure, and to the country's ability to finance education, public health, environment and the arts'

Alan Blinder and William Baumol

The index of capital city electricity prices has remained within a band of plus or minus 5% of the Consumer Price Index (CPI) for the 22 years between 1986 and 2008. But since then electricity prices have increased around 40% in real terms. [10] This is shown in Figure 1 below:

Figure 1. Changes in electricity prices in eight capital cities relative to CPI



Source: Australian Bureau of Statistics 6401.0, Table 7, CME analysis.

Whereas the average price of *producing* electricity has remained roughly constant over the last decade, in the period from 2001 to 2010 the average annual price of *distributing* it has increased by 3.5%[11] in constant currency. Following a series of decisions by the Australian Energy Regulator (AER) in 2009 and 2010, distributors' revenues in constant currency will increase on average by 7%[12] per annum for the next four years, roughly double the rate of the last 10 years.

Rising electricity prices has meant that the utility sector has played a major part in the dramatic deterioration in Australia's productivity over the past decade. From 2001 to 2010, the utilities sector (covering electricity, gas, water and waste water) had the most rapid decline in multi factor productivity – about 3.7% per year – of all 12 industry

sectors examined by the Australian Bureau of Statistics[13]. Electricity is by far the largest element of this industry sector, and monopoly electricity distribution[14] is by far the largest component of the electricity industry.

Electricity users are bearing the burden of higher prices and the decline in the productivity of electricity distributors. The Energy Users Association of Australia, on behalf of its members, has commissioned this report to investigate the reasons for this, and to provide some suggestions on what might be done about it.

Rising demand and ageing assets has been cited by several interested parties as the main explanations for rising prices. The Energy Network Association (which represents the distribution monopolies) cites these explanations[15], as did the Australian Industry Group[16] which represents small businesses, the Reserve Bank of Australia[17], the Ministerial Council on Energy (which represents the Commonwealth and jurisdictional governments' energy ministers) and the Prime Minister of Australia[18]. The AER and the Australian Energy Markets Commission (AEMC) said that higher prices are needed to allow distributors to cope with new connections, rising peak demand, to replace ageing assets and to meet obligations for security, safety and reliability.[19] Most recently, the AER has attributed rising prices to historic under-investment.[20]

However, some suggested that there may be more to the rising prices than a supposedly efficient response to rising demand, ageing assets and historic underinvestment. The Commonwealth Department of the Treasury has said that the reasons for the significant decline in productivity are unclear[21] and the Prime Minister of Australia referred to "reform" (i.e. privatisation) in Victoria as an example that other states could learn from.[22] The Garnaut Review pointed to incentives for network businesses to behave in ways that are contrary to the interests of electricity consumers, and suggested urgent and thorough review of the regulatory framework.[23] Professor Parry, previously Chairman of the Independent Pricing and Regulatory Tribunal (IPART) in New South Wales has blamed government ownership for the outcomes in New South Wales.[24] The current Chairman of IPART has suggested that the regulatory framework be reviewed.[25]

Mountain and Littlechild (2010) compared the outcomes delivered by electricity distributors in New South Wales (NSW), Victoria and Great Britain (GB). Their research observed that a decade ago, electricity distribution network revenues per customer in NSW were twice those in GB. Recent price controls imply that by 2014 they will be nearly four times as high. Their paper concluded that the main reason does not seem to

be geography, operating environment or industry structure. It suggested that the regulatory framework and the practice of the regulatory body within that framework seem relevant and that perhaps the most important explanatory factor is private ownership in GB and Victoria compared to state ownership in NSW. They also suggested that this could impact on the nature and effectiveness of regulation.

This report extends the Mountain and Littlechild research by examining the outcomes delivered by electricity distributors in New South Wales, Victoria, Queensland and South Australia[26] and also briefly in comparison to distributors in Great Britain. It critically examines whether growth in demand and connections, ageing assets, higher planning standards and historic underinvestment explains declining productivity and rising prices. It then examines the role of ownership, regulatory design and regulatory practice. Finally the paper suggests policy and regulatory reforms that will help to raise productivity and lower prices in this important part of Australia's energy industry. Appendix A is a description of the benchmarking methodology. Appendix B is our response to comments on an earlier version of this report by the Ministerial Council of Energy (MCE), which we have not accepted. Under the funding agreement with the Consumer Advocacy Panel, recipients are required to allow the MCE to comment on matters of fact, data and related calculations. Consumer Advocacy Panel funding recipients are required to provide an explanation in their reports for any comments made by the MCE that they reject.

2 Overview of the distribution sector

The electricity distribution industry in Australia is a major industry. Its business is to conduct electricity from substations connected to the main transmission system, to points of connection with homes and industry. The main activities in this business are to construct, operate and maintain networks of overhead wires and underground cables, transformers and switching substations of various sizes.

Eleven electricity distributors in Queensland, New South Wales, Victoria and South Australia have monopolies to distribute electricity within their licenced areas of supply. These monopolies own and operate networks that the AER currently values at more than $51bn[27]. This network, strung end to end, is more than 714,000km long[28] – enough to circle the equator 18 times. These distributors use it to provide around 145 TWh[29] of electrical energy per year to around 8.8m[30] connections.

In return for providing this distribution service, in 2011 these 11 distributors are expected to collect regulated revenues of around $7.8bn[31]. In calculating these regulated revenues, the AER has expected that they will spend around $8.6bn[32], $6bn[33] of which will be capitalised in their regulatory accounts. The cost of distribution is by far the biggest single element of the cost of supplying electricity to the average consumer. In 2010, users were charged around 30% more for the distribution of electricity than they were charged for its production. [34]

Structure and ownership

The 11 distributors in these four states range in size from Citipower distributing electricity in a 157 square kilometre area of Melbourne to Ergon Energy distributing electricity over an area of 1.7 million square kilometres – more than three times the area of France. There are six distributors (Citipower, United Energy, Jemena, Endeavour Energy (previously known as Integral Energy), Ausgrid (previously known as Energy Australia) and Energex) whose networks service predominantly metropolitan (i.e. urban and suburban) areas and five distributors (SP Ausnet, Powercor, ETSA, Essential Energy (previously known as Country Energy) and Ergon) who service a mix of regional cities and country areas.

The state governments of New South Wales and Queensland own the distributors in New South Wales (Endeavour Energy, Ausgrid and Essential Energy) and Queensland (Ergon Energy and Energex) respectively. Electricity distribution has been a highly profitable monopoly for its state government owners. From 2004 to 2010:

- The NSW distributors achieved an average pre-tax rate of return on regulated assets of 6.3%. From this return it paid the NSW State Government $4.1bn (2010$) in income tax equivalents and dividends delivering a return on equity of around 16% per year.[35] Government owned distributors, following the AER's recent decisions, have projected even higher rates of return on equity. For example Endeavour Energy has projected equity returns of 19%[36]
- The Queensland distributors achieved an average pre-tax rate of return on regulated assets of 5.5%. From this return it paid the Queensland State Government $2.6bn (2010$) in income tax equivalents and dividends delivering a return on equity of around 9.8%.[37] Forecasts of dividends and tax in Queensland were not available.

The five distributors in Victoria and one in South Australia are privately owned, the latter through a 99 year lease. Major shareholders of these distributors include Australian superannuation funds, the Singaporean sovereign wealth fund and a privately held Hong Kong conglomerate. The Victorian distributors have also been highly profitable businesses. In 2009 for example, the average pre-tax return on assets was 8%[38]. The government that own distributors also receive income tax equivalents on their profits. Therefore although the private Victorian businesses have historically achieved higher pre-tax returns on assets than their government owned peers in New South Wales and Queensland, their post tax return on equity is likely to be comparable.

Regulation

The monopoly distributors ultimately recover the cost of network services from the end users. Distributors have discretion in setting the structure of network tariffs and the methodology for their calculation. Retailers have no obligation to recover exactly the amount specified in network tariffs - they are generally free to recover network costs from their customers as they choose[39].

The average prices charged by the distributors are regulated[40]. Jurisdictional economic regulators made these regulations until the jurisdictional governments decided to voluntarily cede authority for this to the AER, which commenced as the regulator of electricity distribution networks on 1 January 2006.

The main institutions that play a role in the economic regulation of distributors are the Ministerial Council on Energy (MCE), the Australian Energy Markets Commission (AEMC) and the AER. The MCE is a policy-making body. It also appoints the members

of the AEMC, and the Chairman and one of the other two part-time members of the AER. The AEMC sets the National Electricity Rules that the AER is required to apply in regulating the prices charged by the distributors.

The merits of any part of a price/revenue control decision by the AER can be appealed to the Australian Competition Tribunal (ACT) or the Federal Court. Appeals relating to the legality of AER decisions can be made to the Federal Court. Every regulatory decision by the AER affecting distributors has been appealed to the ACT. ACT decisions have had a very significant impact on network prices paid by customers.

Although the jurisdictional governments have ceded economic regulatory authority to the AER, they retain the ability to set the planning standards to which networks in their jurisdictions are to be built. Through this, the jurisdictional governments can also significantly affect the level of expenditure by the distributors operating in their areas.

Economic regulation of the distributors takes the form of a cap on the average prices that distributors are allowed to charge (and in Queensland, a cap on the maximum allowed revenues). These caps are put in place for five years although these price/revenue cap decisions have been "re-opened" by those regulators during the price control periods. The impact of this re-opener arrangement has been to increase expenditure allowances.

The regulatory process involves the regulated distributors proposing price/revenue caps (and the levels of expenditure to justify those caps). The regulator reviews those proposals and if it does not accept the distributor's proposals is required to explain why and justify its explanation by showing the detailed workings of its alternative view.

The calculation of price/revenue caps allows for the regulator's determination of the efficient level of operating expenditure, for a financial return on existing and new assets, and for the depreciation of those assets. Through the capped prices/revenues, distributors can improve their profits by reducing costs. Shareholders retain the benefit of these cost reductions for the duration of the price/revenue control. The benefits of cost reductions will then be passed through to consumers in reduced expenditure allowances in the following price control period. Through this, the regulatory model is meant, in principle, to provide financial incentives for distributors to incur less expenditure than the regulator has allowed for in the determination of the capped prices.

It should be stressed that a number of conditions need to be met to ensure that this model works effectively. In particular it is critically important that the regulator is able to constrain the expenditure claims of the distributors in setting the expenditure allowances for the regulatory control periods.

The history of energy reform in Australia

The Grattan Institute (Grattan 2011, page 19) noted that declining productivity in utilities since 2000 followed substantial productivity gains in the 1990s[41]. It attributed these productivity gains to "reforms" engineered by state governments. These reforms were part of a much broader reform of the Australian economy that included withdrawal of tariff barriers, liberalisation of exchange rates, privatisation of banks and extensive micro-economic reform particularly of state government institutions and responsibilities, including electricity.

The intellectual framework for much of the reform affecting the utility sector was established in the Hilmer Review in 1993.[42] This lead to:

- structural reforms (the disaggregation of vertically-integrated government owned energy commissions);
- the creation of an electricity market between producers and retailers;
- privatisation (in Victoria initially and subsequently in South Australia and much later to a more limited extent in Queensland and New South Wales); and
- regulated access to the monopoly elements of the industry.

The major regulatory reforms affecting electricity distributors – independent economic regulation – were first implemented in Victoria when the industry was separated into five contiguous monopolies and then privatised in 1995. Jurisdictional governments in New South Wales and Queensland then implemented this regulatory approach for their government owned distributors from the mid 1990s and in South Australia for it's distributor which it privatised in 2000.

As Section 3 shows, the application of independent economic regulation by jurisdictional government regulators in their first regulatory decisions from the mid 1990s delivered steady or in some cases declining prices. In most cases, their second regulatory decisions delivered higher prices although not significantly so in all cases. In 2006, the jurisdictions voluntarily transferred regulatory authority to the Australian Energy Regulator (AER), which commenced as the regulator of electricity distribution

networks on 1 January 2006. The AER has suggested that this would promote national consistency, reduce regulatory costs, and more clearly separate regulation from policy.[43] However, Section 3 shows the outcome has been significantly higher prices and lower productivity.

This report suggests that developments in the regulation of electricity networks, particularly over the last five years, while sold as reforms intended to serve the long term interests of consumers, have in fact delivered sharply rising prices and declining productivity - exactly what the Hilmer Review had set out to remedy nearly 20 years ago.

3 Outcomes

This chapter presents comparisons of revenues, expenditure, service levels and efficiency of distributors in Victoria, New South Wales, Queensland and South Australia. These comparisons allow assessments to be made of relative performance and establish whether or not there is an efficiency issue that merits attention. The results presented in this section are based on an extensive database of regulatory decisions by the AER and previous jurisdictional regulators, and also on distributor annual reports and related data sources. The section also compares the outcomes of these distributors with those of the 14 distributors in Great Britain.

3.1 Comparison of revenue, expenditure, assets and service performance.

Figure 2 shows how the allowed revenue per customer connection – in constant 2010 dollars - varies for distributors operating in the four states.[44] This measure shows how much revenue each distributor collects per connection they distribute electricity to. The figure shows that in 2001 distributors in Queensland, New South Wales and Victoria all recovered similar levels of revenue per customer. This data for South Australia is not available before 2006.

The figure shows approximately constant revenues per customer in the first regulatory control period starting at the beginning of the 1990s. This continued in Victoria for the second regulatory control period (from the mid 1990s) whereas revenues began to rise in Queensland in particular, and less so in New South Wales. Revenues in the third regulatory period[45] (from the end of the last decade) rose sharply in Queensland, New South Wales and South Australia but less so in Victoria. By the end of the third regulatory period in 2014/15, revenues per customer in New South Wales and Queensland will be twice those in Victoria.

Figure 3 compares the revenue per connection from government owned and privately owned distributors. The government owned distributor curve is the weighted (by connection number) results for the distributors operating in NSW and QLD, while the privately owned is the weighted result for distributors operating in Vic and SA. The figure shows the clear divergence, particularly from 2009 onwards, in revenue per connection for government and privately owned distributors.

Figure 2. Allowed revenue per connection (2010$)[46]

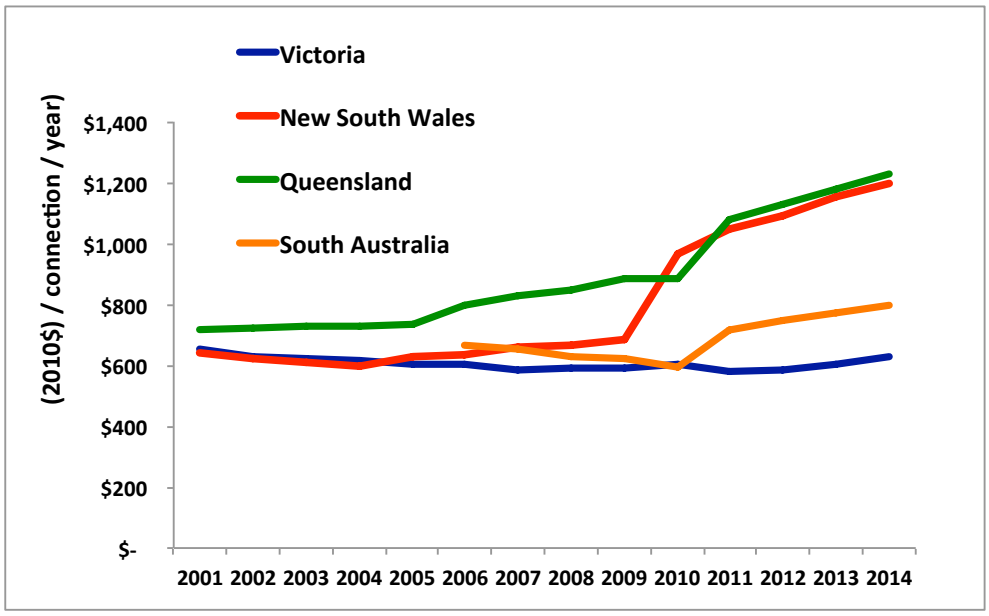


Figure 3. Revenue per connection for government and private distributors[47]

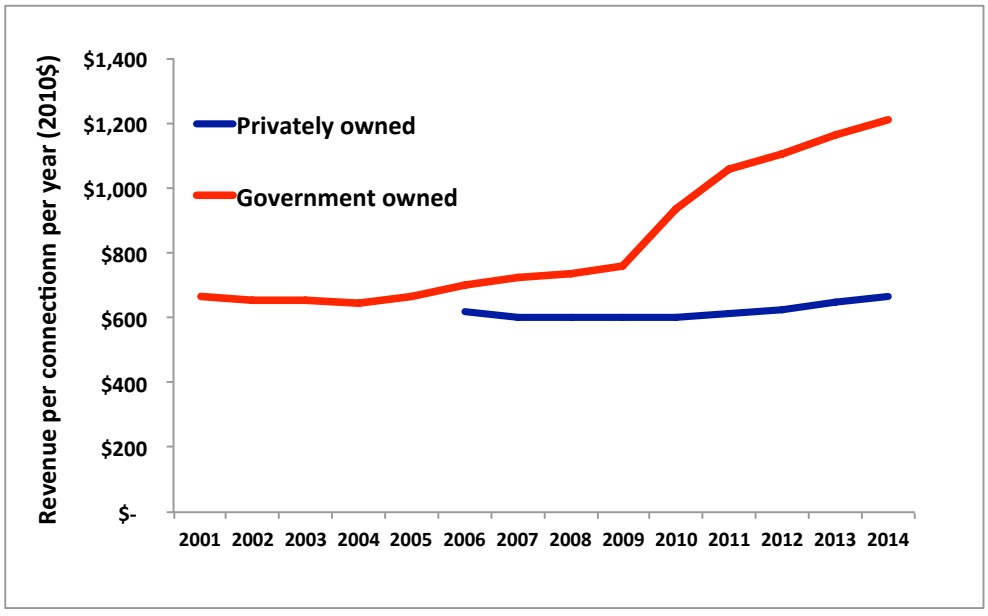


Figure 4 shows that the increase in revenue per connection has been approximately at the same rate for country and metropolitan distributors – i.e. country distributors have consistently received around $150 more per year from their customers, than have the metropolitan distributors.

Figure 4. Revenue per connection for metropolitan and country distributors

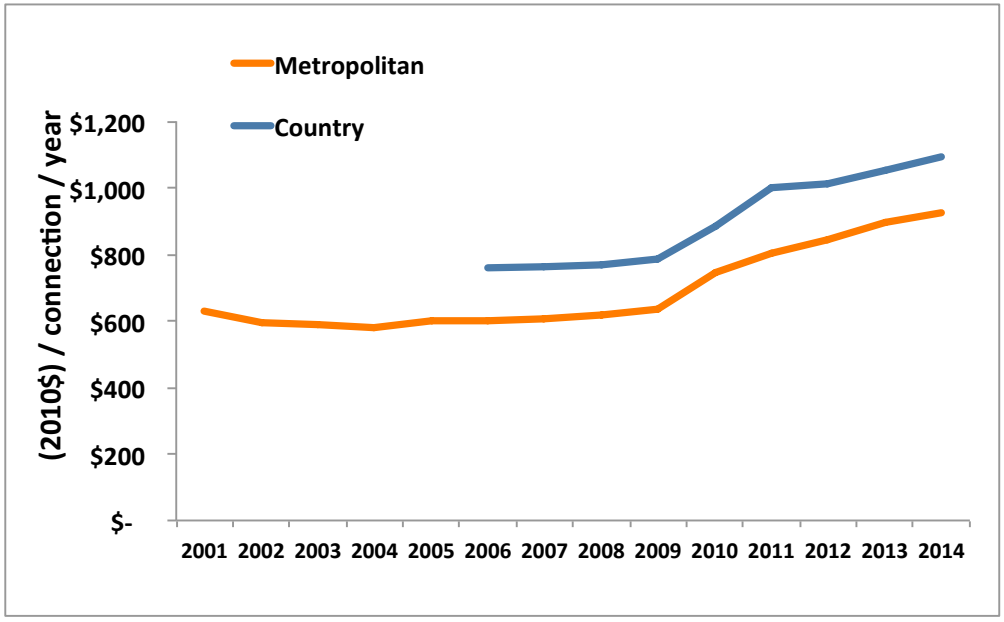


Figure 5 and Figure 6 show that the trend of much faster revenues increases per connection for government distributors is consistent for distributors serving metropolitan and country areas respectively.

Figure 5. Revenue per connection for metropolitan distributors[48]

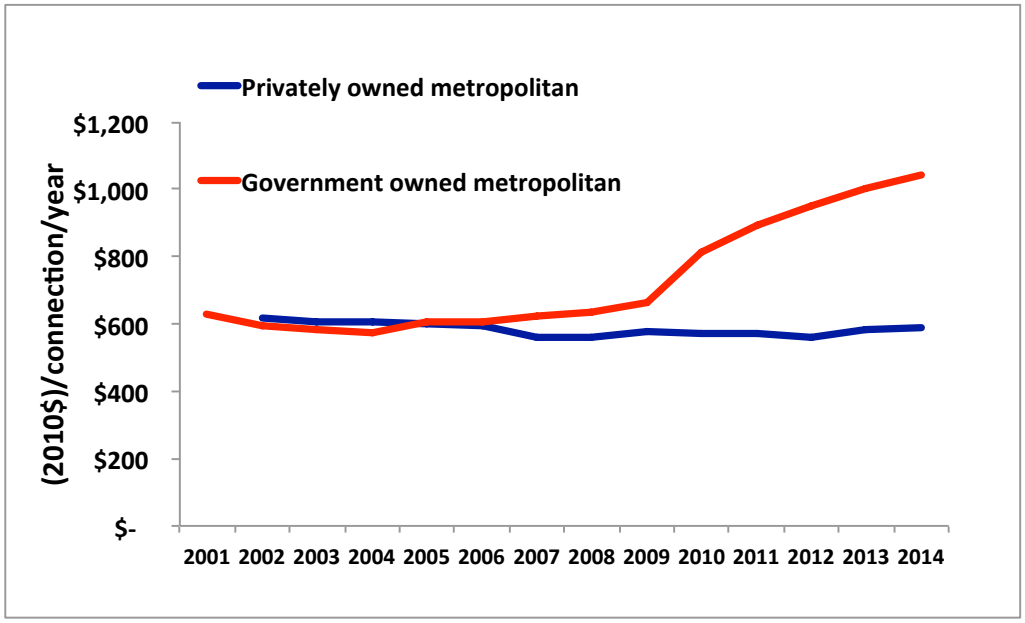
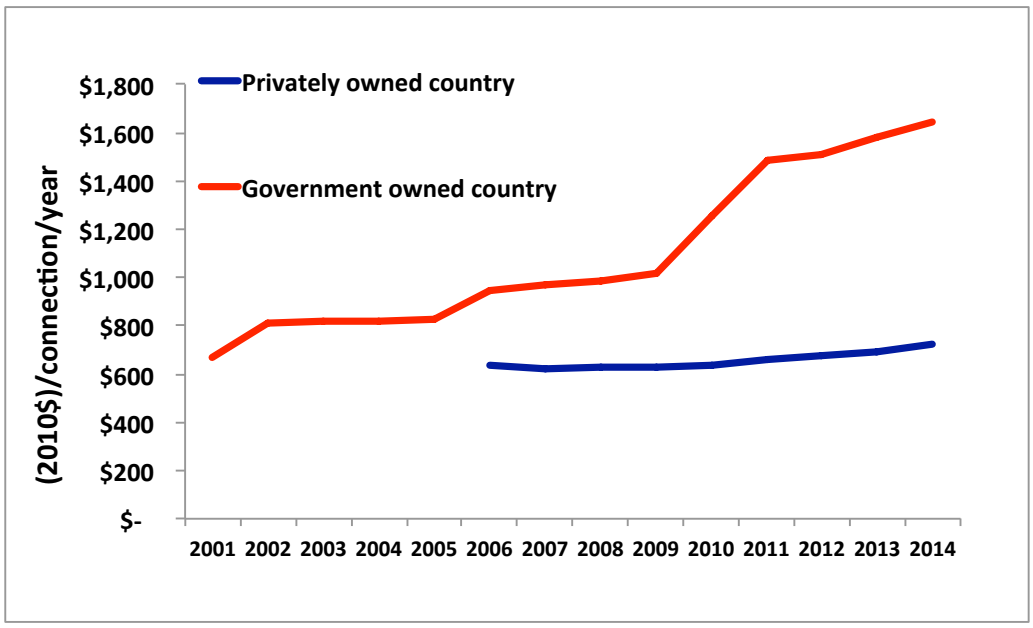


Figure 6. Revenue per connection for country distributors[49]



In the price-cap regulatory model, the allowed revenue covers an allowance for operating expenditure and for depreciation and a return on assets that have been capitalised in the Regulatory Asset Base (RAB). Figure 7 shows that the level of operating expenditure per customer that the regulator has allowed the distributors to recover, has trended upwards gradually and that the gap between the allowance that the regulator has made for government owned distributors and privately owned distributors – about 50% more per customer for government owned distributors - has not grown significantly.

Figure 7. Allowed operating expenditure per connection[50]

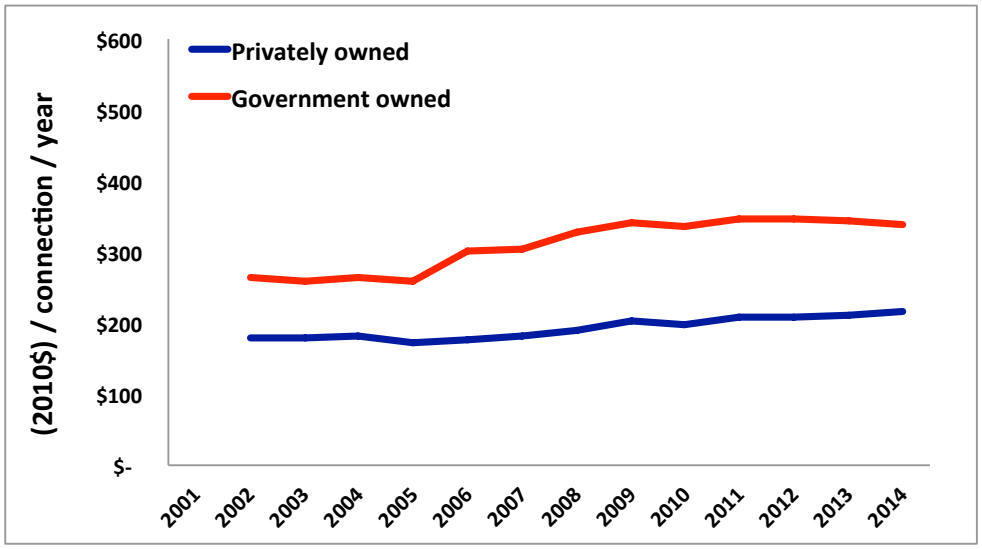
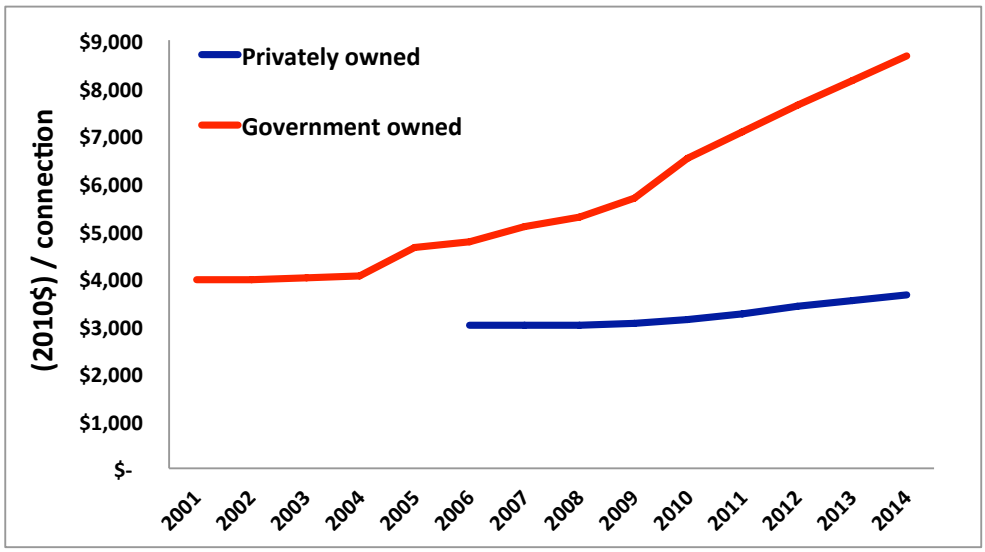


Figure 8 shows how the size of the RAB per customer varies for government owned and privately owned distributors. Whereas in 2006, government owned distributors had one-third more capital invested per customer served than privately owned distributors, by 2014 this will have risen to three times more. In conjunction with Figure 7 it can be seen that it is the increase in the size of the regulatory asset base (and the consequential increase in the charges for depreciation and return on assets) that explains the growing gap in the revenue per customer recovered from government owned and privately owned distributors.

Figure 8. Regulatory asset base per connection[51]



The rapid increase in the size of the RAB of government owned distributors is attributable to the substantial increase in capitalised expenditure per customer served. This is shown in Figure 9. This shows a gradual increase for the privately owned distributors but a significant increase for the government owned distributors, which had 60% greater capitalised expenditure per customer than privately owned distributors in 2002, but are expected to have a little under 300% greater capitalised expenditure in 2014.

A comparison of revenues and expenditures such as this that shows some businesses as performing better than others, invites the question whether such better financial performance has been at the expense of a degradation in service performance. To examine this Figures 10 and 11 compare the service performance of the distributors (in respect of the frequency of power interruptions and the duration of power interruptions respectively) and then produces weighted average results for government owned and privately owned distributors. These results show that on average

government owned distributors provide slightly lower levels of service (more frequent and longer outages) than their privately owned peers.

Figure 9. Capitalised expenditure per connection[52]

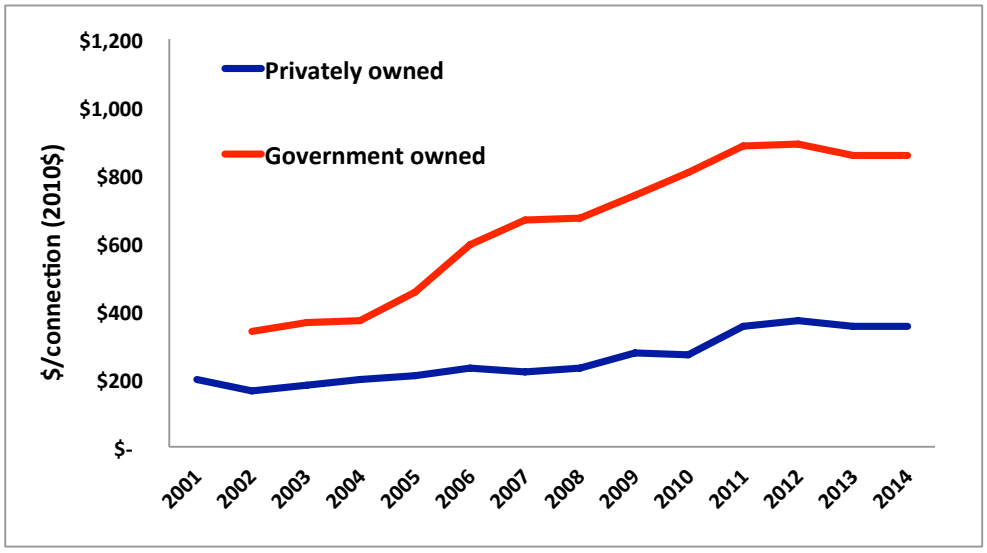


Figure 10. System average interruption frequency[53]

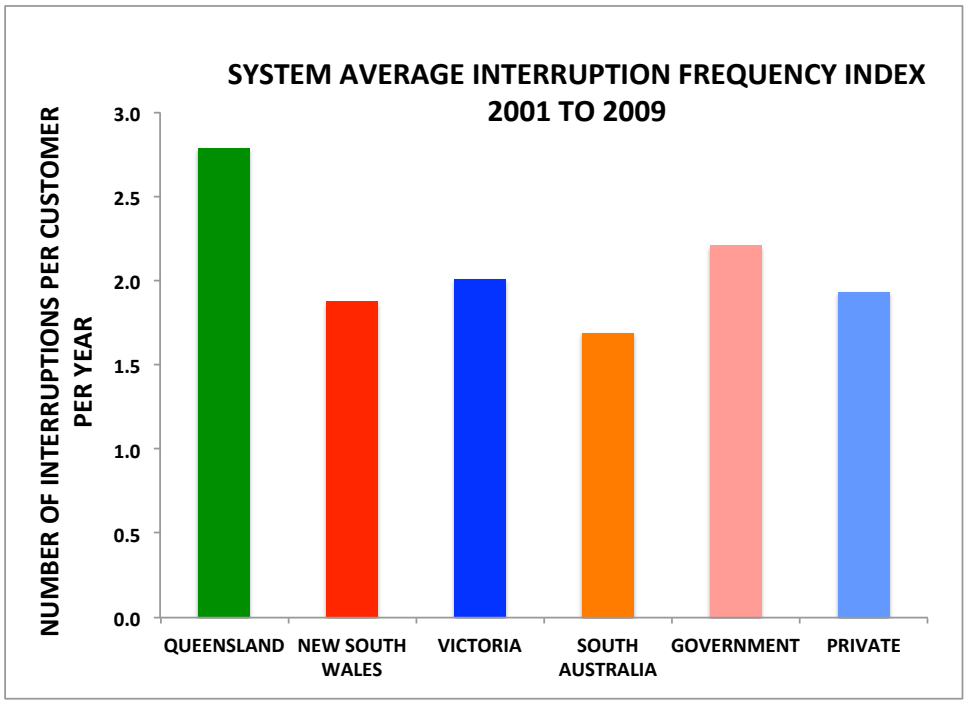
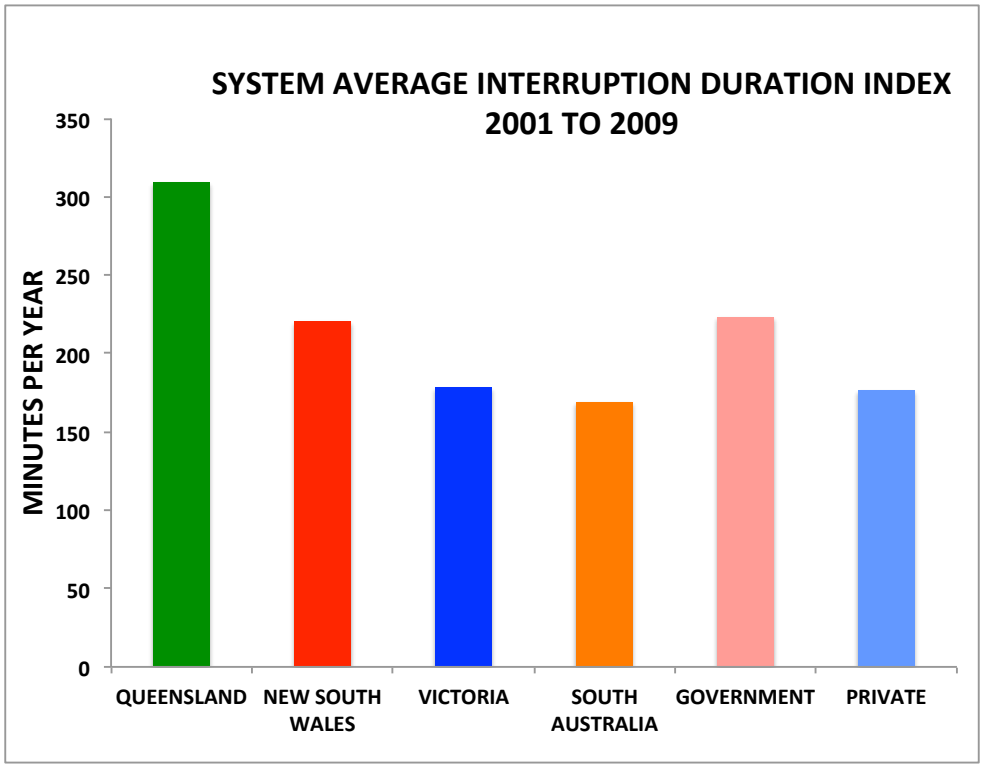


Figure 11. System average interruption duration[54]



3.2 Efficiency benchmarking using statistical regressions

The results presented in this section so far are the ratios of the revenues or expenditures relative to customer numbers. These ratios are strongly suggestive of differences in efficiency. But it is not possible to draw categorical conclusions from this on the relative efficiency of the distributors. To be able to draw such conclusions, it is necessary to develop a systematic benchmark analysis using accepted econometric or statistical techniques. A variety of recognised methodologies are available to do this.

We developed a regression analysis to benchmark the efficiency of the distributors. Our regression is of total annual expenditure against a composite scale variable consisting of line length and number of customers. The efficiency frontier was chosen to be the upper quartile level of performance. This was used to measure the relative efficiency of the 11 distributors. This assessment was then replicated over all three regulatory periods, and from this the relative change in efficiency of the distributors across the three regulatory periods was measured.

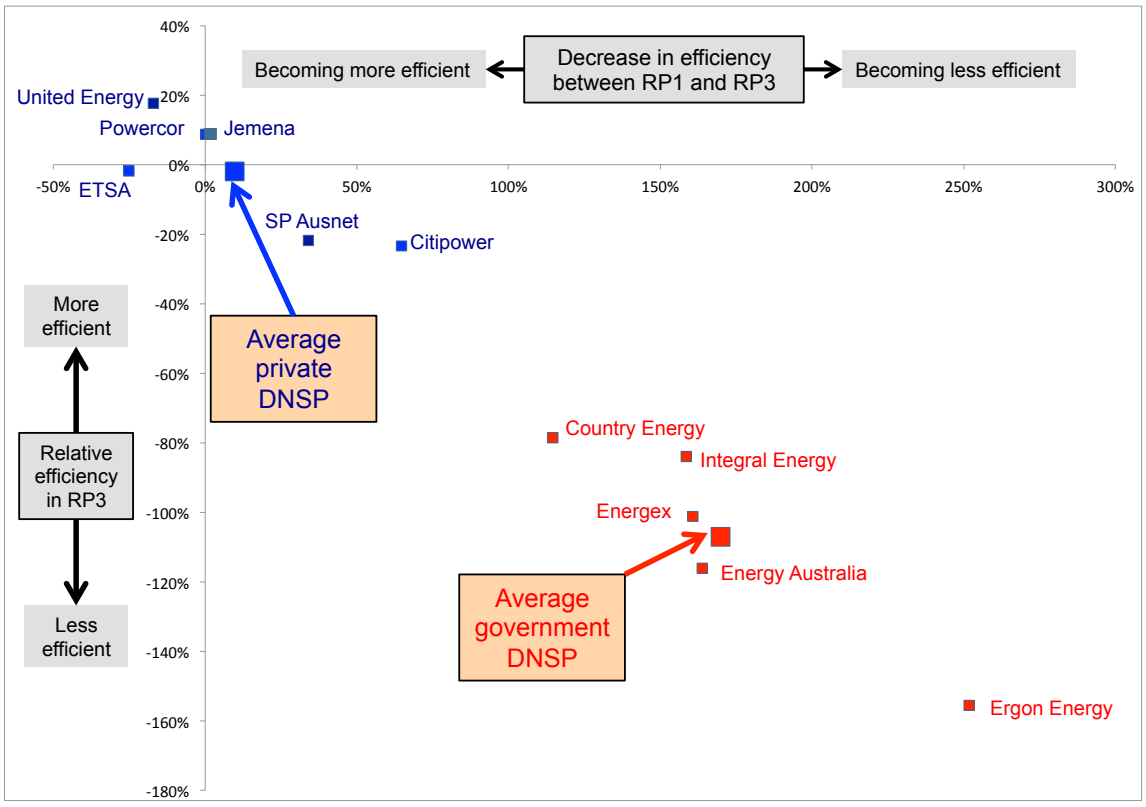
The results were then mapped so that the relative efficiency of the distributors in the third regulatory period (the regulatory period currently under way) was mapped

against the change in the efficiency of the distributors between the first and third regulatory periods. This mapping provides concise information on the relative efficiency of the distributors in the regulatory period under way, and how this efficiency has changed over the three regulatory periods.

The results of this analysis are shown in Figure 12. In this figure, the y-axis shows the relative efficiency of distributors based on the expenditure allowances in the third regulatory period. This shows United Energy as the most efficient distributor and Ergon Energy as the least efficient distributor. It shows that the average performance of the privately owned distributors is at the upper-quartile of all distributors. By comparison, the average government owned distributor is around half as efficient as the average private distributor (i.e. they incur more than twice as much expenditure to deliver the same level of output as the average privately owned distributors).

The x-axis shows how the efficiency of the distributors has changed between the first and third regulatory periods. This shows that the average private distributor had remained at around the same level of efficiency in the first and third regulatory period. By comparison, the average government distributor will spend 150% more in the third regulatory period than in the first.

Figure 12. Benchmarking relative efficiency and changes across regulatory periods.



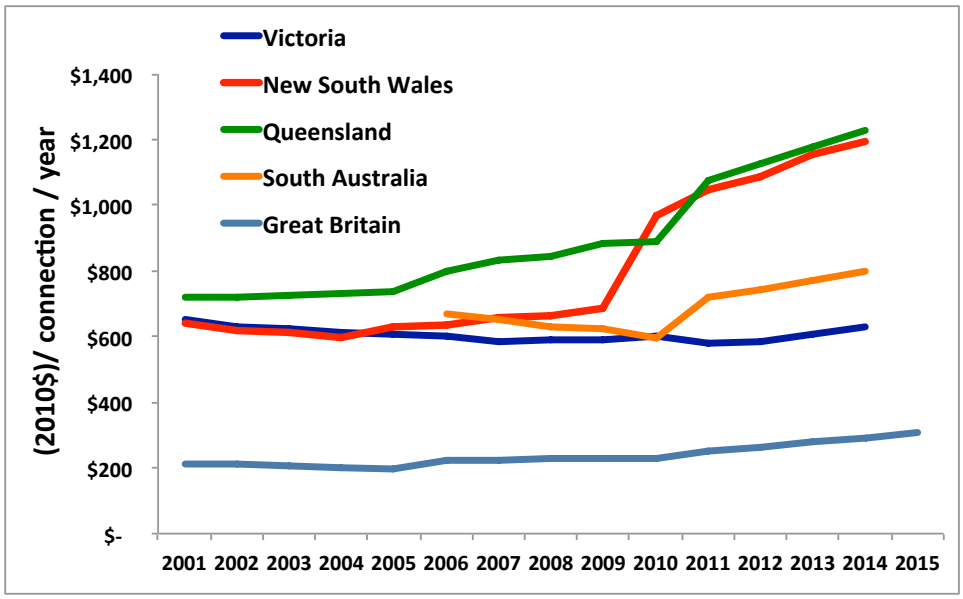
The key points from Figure 12 are that:

- privately owned distributors are on average twice as efficient as government owned distributors; and
- the efficiency gap between private and government owned distributors has grown significantly over time.

3.3 Comparing NEM distributors to those in Great Britain

Finally, the analysis so far has focused only on outcomes by distributors in Australia. Mountain and Littlechild (2010) noted the big (and rising) differences in revenues and expenditure per customer for distributors operating in New South Wales and those in Great Britain. Their research observed that a decade ago, electricity distribution network revenues per customer in New South Wales (NSW) were twice those in Great Britain (GB). Recent price controls imply that by 2014 they will be nearly four times as high. This is shown in Figure 13. This figure shows that the revenues per customer in NSW and QLD will be comparable in 2014, at roughly 1.5 times the level in South Australia, twice the level in Victoria and four times the level in Great Britain. Figure 13 shows that while the performance of Victorian distributors particularly in comparison to the performance of distributors in NSW and QLD is impressive, this is much less so when comparing VIC distributors with their British peers.

Figure 13. Revenues per customer in Australia and Great Britain[55]



3.4 Summary

In summary, the main observations from the results presented in this section are as follows:

- Government owned distributors currently charge almost twice as much as privately owned distributors. The gap has been getting bigger since 2001 and will increase even further until at least the middle of this decade;
- The main reason for the rising revenue of government owned distributors is growth in expenditure that has been capitalised;
- Customer service levels have remained approximately constant over the last decade, and on average government owned distributors provide inferior levels of service compared to their privately owned peers, although not significantly so;
- The greatest increases in revenues and expenditure have resulted from regulatory decisions by the AER, rather than predecessor jurisdictional regulators. This is true both for privately owned distributors and government owned distributors, although significantly more so for government owned distributors;
- Government owned distributors in Australia would need to halve their expenditure levels to achieve a comparable level of efficiency as their privately owned peers;
- In comparison with Great Britain, distributor revenues per connection are twice as high in Victoria, three times in South Australia and four times as high in Queensland and New South Wales.

4 Possible explanations for rising prices and declining productivity

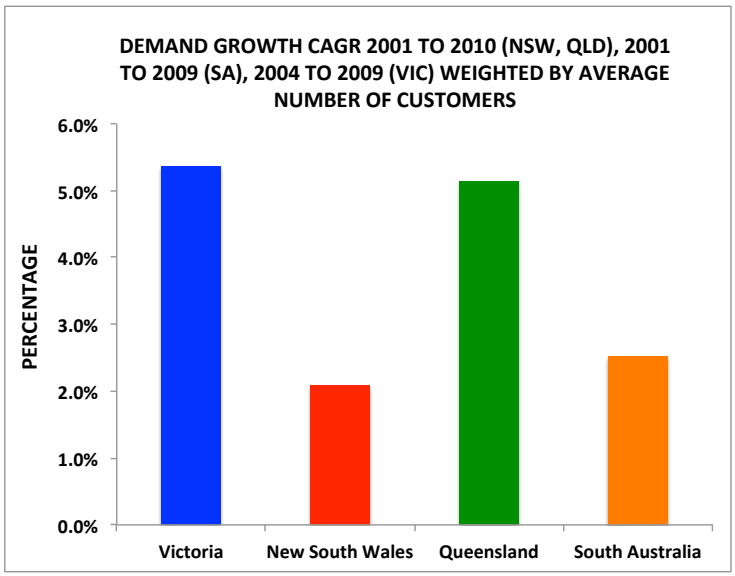
This chapter examines possible explanations for the results shown in the previous chapter. It begins with the widely cited reasons (rising demand, ageing assets, historic underinvestment, higher service standards) and ends with other possible reasons (asset valuation, allowed rates of return, customer density, ownership, regulatory design and conduct). A summary at the end draws out the main points.

4.1 Rising peak demand

Chapter 1 noted that the AER, Ministerial Council on Energy, and Energy Networks Association have all cited rising demand to explain higher expenditure and rising prices.

Demand has been growing in Australia. The non-diversified weighted (by customer number) peak demand for the distributors has grown by 3.7% per year on average over the last decade.[56] However the compound annual growth rate (CAGR) of the demand served by distributors has varied considerably in different jurisdictions. Victoria and Queensland have had approximately comparable rates of growth, while South Australia and New South Wales have had about half their rate. This is shown in Figure 14.

Figure 14. Demand growth rates



The demand growth stated in terms of average annual MW, rather than a rate, is shown in Figure 15. This shows that demand growth has been by far the greatest in VIC, with NSW and QLD approximately comparable and SA well behind. Demand growth stated in these terms rather than as a rate is a clearer indication of the additional demand that the distribution system is required to meet.

Figure 15. Demand growth MW per annum average over the measured periods

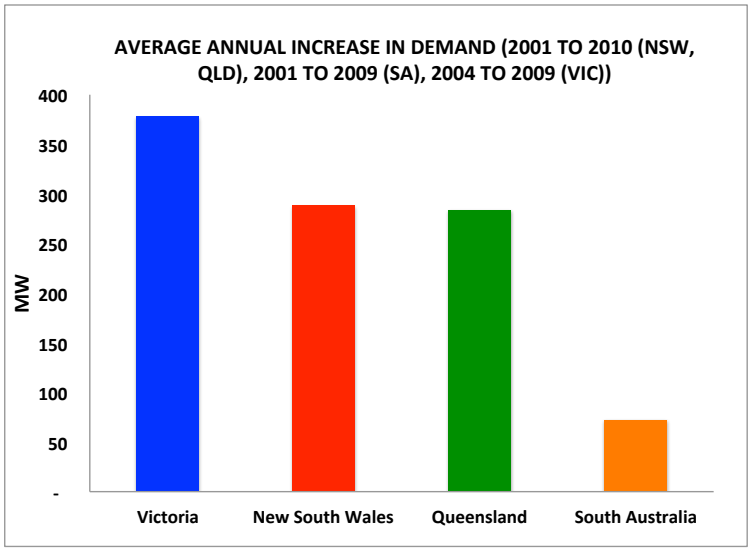


Figure 9 showed the capitalised expenditure on distribution networks. This showed that expenditure in NSW and QLD has by far outstripped expenditure in VIC and yet Figure 15 shows that demand has grown more in VIC than either NSW or QLD. This begs the question: if demand growth is a significant explanation of expenditure, why is the growth in capitalised expenditure so much higher in NSW and QLD than in VIC?

To attempt to answer this, we analysed the AER's decision documents in greater detail. These documents disclose the AER's assessment of the amount of capitalised expenditure that is needed to allow the distributors to meet growing demand. The results of this examination for the regulatory period under way are shown in Figure 16 and Figure 17. The average growth-related capex allowed by the AER is a little over one-third of the total allowed capex in the current regulatory period.

Figure 16. Growth-related expenditure per new connection

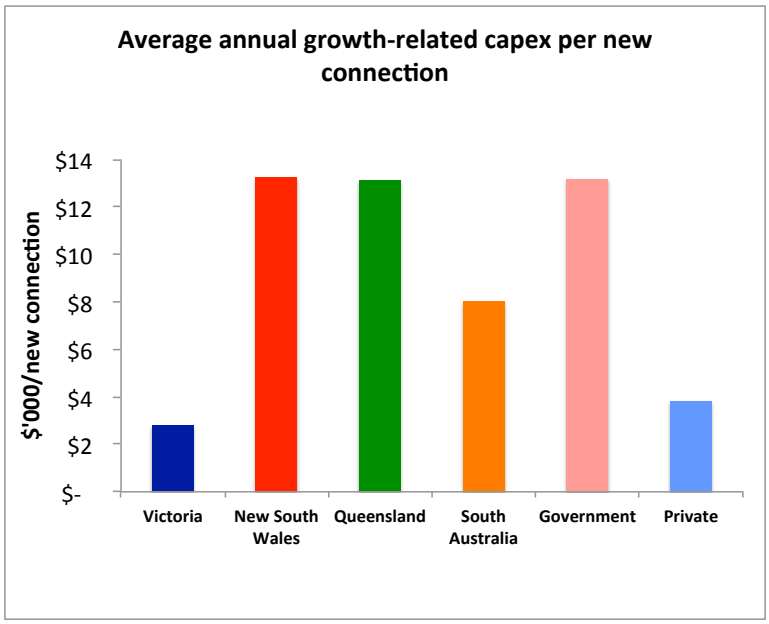
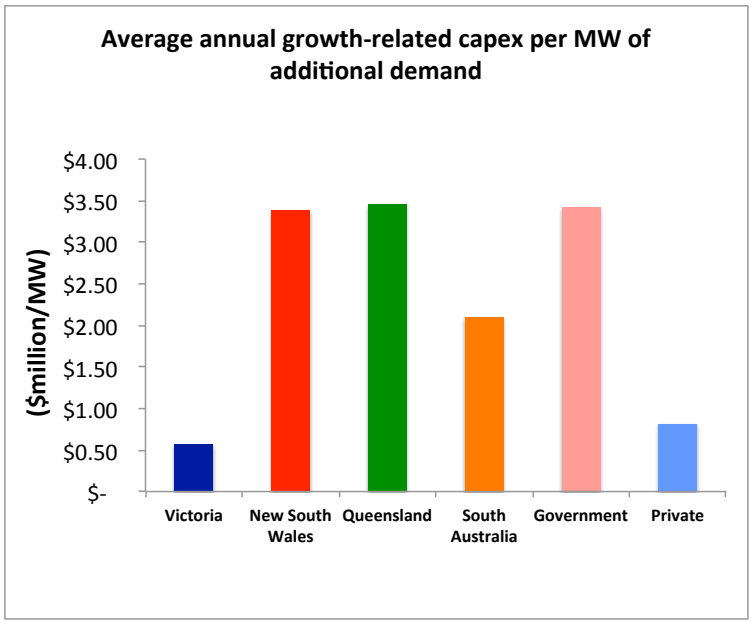


Figure 17. Growth related expenditure per Megawatt (MW) of additional demand



These figures shows the level of capitalised expenditure that the AER believes is needed in the current regulatory period to meet growing demand, calculated per expected number of new connections (Figure 16) or per MW of expected additional capacity (Figure 17). This calculation assumes that the historic trend rate of growth in demand each state is maintained during the current regulatory period.[57] Customer number growth is based on assumptions in AER price/revenue cap decision documents for the current regulatory period. Figure 17 shows that the AER has allowed

around $3,000 of additional growth-related expenditure per new connection in Victoria. By comparison, in NSW and QLD around $13,000 of growth-related expenditure has been allowed per connection. Similarly, when expressed as expenditure per MW of additional capacity, Victorian distributors have been allowed around $0.3m per additional MW, while NSW and QLD distributors have been allowed more than $3.5m per additional MW – more than 10 times as much.[58]

In summary, rising demand does justify higher expenditure, but a comparison of the outcomes in VIC, NSW and QLD suggests that the reason for much higher demand-related expenditure is only partly explained by growing demand. More significantly, the AER has allowed government owned distributors to spend more than four times more per additional MW of demand as they have allowed privately owned distributors.

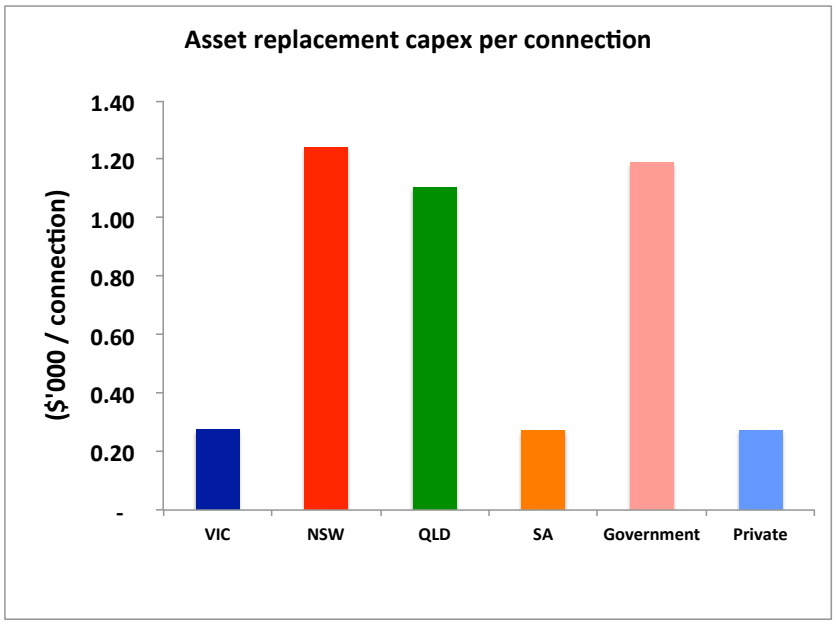
4.2 Ageing assets

As assets get older they wear out or become redundant and need to be maintained or replaced in order to maintain service levels. The AER, Energy Network Association and the distributors have said that capital expenditure has needed to increase significantly to replace ageing assets. Accordingly, distributors have proposed significant increases in capitalised expenditure to replace ageing assets, and the AER has allowed this expenditure to be made and recovered in regulated charges.

We examined the AER's decision documents to determine how much capitalised expenditure the AER has decided is needed to allow the distributors to replace ageing assets. This information was then expressed per customer, to calculate the average annual capitalised replacement expenditure per customer during the current regulatory period. The results of this analysis are shown in Figure 18.

This shows that the AER has calculated that the VIC distributors have been allowed around $300 per customer per year to replace ageing assets. By contrast, the AER has calculated that NSW distributors should get more than four times as much – around $1,300 per customer – to replace ageing assets. On average, the AER has concluded that the government distributors should get nearly four times as much per customer as privately owned distributors, to maintain or replace ageing assets. Since expenditure on asset replacement is around half the total capitalised expenditure, this difference is significant.

Figure 18. Asset replacement capitalised expenditure per connection



What could explain this difference? Are the assets of government distributors so much older than the assets of private distributors to justify so much more replacement expenditure? To assess this we examined the remaining asset life of government owned distributors compared to privately owned distributors. If government owned assets are much closer to the end of their lives, then it may be understandable that much higher replacement expenditure is needed.

The AER's Post Tax Revenue Models contains data on the remaining asset lives by asset classes. A weighted average remaining asset life can be calculated by weighting the remaining asset life in each asset class, by the value of the assets in that class. Our analysis of this, using the remaining asset life at the beginning of the current regulatory period (i.e. before expenditure during the regulatory period is incurred) shows that the South Australian distributor, ETSA, had the shortest remaining asset life (19 years), and the Queensland distributors the longest (33 years) with the NSW (28 years) and the Victorian (24 years) a little below this. Weighted by their asset bases, government owned distributors had 31 years remaining asset life, while the privately owned distributors had 22 years. These calculations of weighted remaining asset life, it should be noted, are at the *start*, not the end, of the current regulatory period in which the AER decided that the government owned distributors should be allowed to substantially increase their replacement expenditure.

The fact that the assets of privately owned distributors have a shorter remaining life suggests that the privately owned distributors might be expected to be spending more than the government owned distributors to maintain and replace assets. Yet, as noted, the opposite is the case: the AER has decided that the government owned distributors should get more than four times as much per connection to replace and maintain assets, as it has allowed the privately owned distributors.[59]

This evidence does not support the argument that asset ageing is a major justification for higher expenditure. Rather the higher allowance that the AER has determined for replacement expenditure by government owned distributors relative to privately owned distributors, seems to be a more accurate explanation.

4.3 Historic underinvestment

One possible explanation for the increase in expenditure over the last decade is historic under-investment. This was alluded to by the Prime Minister in a speech to the Australian Industry Group, quoting the views of an industry consultant and previous head of the Energy Supply Association of Australia[60]. Other organisations including the Ministerial Council on Energy, and the Energy Networks Association have not, as far as are aware, suggested that expenditure increases are attributable to historic underinvestment.

The Energy Supply Association of Australia, the NSW Government Pricing Tribunal and the NSW Treasury undertook benchmarking studies of the NSW electricity distributors during the 1990s. A synthesis report of this work noted[61] that between 1982 and 1994 average annual capital productivity growth of NSW distributors was just 0.2% per annum, and that NSW distributors could achieve 20-30% reduction in operating costs through efficiency gains. This contradicts the view that there has been historic underinvestment in New South Wales.

With regards to Queensland, a report by the Independent Panel (commonly referred to as the Somerville Report after the Panel's chairman) established by the Queensland Government in 2004 concluded that "*the networks have not had sufficient expenditure outlaid on them to adequately maintain them and to meet increased demand from growth*"[62]. Prima facie, this conclusion suggests that at least part of the increase in expenditure by Queensland distributors is attributable to a need to rectify historic under-spending.

However, this conclusion can not be accepted uncritically. An alternative view is that the Independent Panel did not produce the evidence to justify its conclusions. Dealing

first with Energex – which provides electricity to around 75% of the electricity consumers in Queensland - the Panel had three specific criticisms:

- Energex had not spent enough money inspecting its cross-poles and in maintaining vegetation;
- The capacity utilisation of the Energex network was too high; and
- Energex should adopt higher planning standards.

With regard to the first criticism, this seems of little significance. Expenditure on pole inspections and vegetation management is a minor item in the budgets of distribution network service providers. The fact that Energex had spent less on these minor items than the Panel concluded was appropriate does not provide persuasive evidence to support the Panel's view of inefficient underspending by Energex.

The second criticism is a judgment by the Panel, on which it is possible to plausibly hold different views. The methodological robustness of a measure of overall average capacity utilisation for a distribution network is questionable. In a distribution network, individual users only make use of part of the network. While some level of network redundancy and spare capacity is needed to ensure that a network is able to deal with a wide variety of uncertainties, what matters for supply security is the level of redundancy on the network elements that serve specific customers. In this sense a calculation of the overall average system-wide capacity utilisation – even leaving to one side that such calculations are highly subjective – is a poor indicator of the level of spare capacity on those specific parts of the network that merit expansion to meet rising demand or improve reliability.

The Panel's last criticism of Energex is not a conclusion that Energex had failed to meet the planning standards it had been set by the Government. The Panel's criticism was simply that it felt that higher standards should be set. This is not evidence of historic under-investment.

The Panel's recommendation that higher standards be set is perplexing considering the fact that Energex's System Average Interruption Duration Index and System Average Interruption Frequency Index performance for the Brisbane CBD area was very good and ahead of comparable interstate distributors. Its overall performance based on all reliability measures was better than the Australian average in 2002/03[63]. In other words, the reliability of Energex's network was in fact quite satisfactory. On this basis,

the Independent Panel's conclusion that Energex had underspent at the expense of reliable supply must be questioned.

With respect to Ergon Energy – which serves around 25% of Queensland's energy users - the picture is less clear. Unlike Energex, Ergon's service performance in 2002/3 was well below the standard of its peers, and this is suggestive of a problem, possibly historic underinvestment.

The merger of six distributors during the previous five years formed Ergon Energy. The Panel concluded that the limited spare capacity in parts of the Ergon Energy network related both to the strong load growth and the realisation that the networks it inherited from its six predecessor organisations had greater constraints than it had first appreciated[64].

In view of this history, and in view of its demonstrated service performance, it may be reasonable to suggest that Ergon may have needed to increase expenditure. However to test this hypothesis it could be reasonable to expect that some form of comparative assessment should be done: was it indeed more expenditure that was needed, or was the problem one of inherited mismanagement? The Independent Panel concluded that benchmarking would not be useful in making such assessment because:

"*the levels of capital expenditure necessarily fluctuate from year to year in any organization … and so it is it difficult to draw any worthwhile conclusions from benchmarking the distributors' capital expenditure for a particular year or years with their peers*".[65]

This denigration of the role of benchmarking in efficiency assessment is contrary to well established evidence of the widely accepted role it should play in the economical regulation of networks.[66]

Finally, the Independent Panel's conclusion on underspending should be seen in the context of the low priority that the Panel accorded to efficiency. The Panel criticised Energex's focus on efficiency improvement, and advised against the efficiency incentives that arise under capped revenues, arguing instead for demand-variant revenue controls and mid-period re-openings of regulatory decisions. They rejected benchmarks and failed to undertake any form of assessment of Energex and Ergon's efficiency, in arriving at their conclusion that catch-up spending was needed. [67]

In summary, there is no evidence to suggest that the higher expenditure by NSW distributors since 2000, and particularly over the current regulatory period is needed to make up for historic underinvestment. In fact the available evidence suggests exactly the opposite is the case. With respect to Queensland, the Independent Panel suggested that historic underspending was responsible for service failures following exceptional heat waves and storms. But the Independent Panel provided no evidence to support this in respect of Energex – whose service performance was superior to the Australian average. Their arguments relating to Ergon are at best, debatable.

4.4 Higher network planning standards

The jurisdictional governments set the planning standards for the distributors in their jurisdictions. These standards describe, usually in very broad terms, the level of redundancy that distributors are required to observe in planning their networks. These planning standards are difficult to describe and there are many variables to be considered in their implementation so that apparently similar standards can in fact lead to substantially different investment decisions.

An outcome of the Independent Panel's review in Queensland was the adoption of higher standards that were intended to deliver higher levels of redundancy. Similarly in New South Wales from around 2006, the Government is understood to have set higher planning standards although information on these higher standards is opaque. In its regulatory decisions, the AER has not reviewed or assessed the standards that jurisdictions have set, to determine whether they could lead to inefficient over-investment. It has instead taken these standard as given.

It is likely to be the case that additional investment, possibly substantial additional investment, has been attributed to higher network planning standards in both New South Wales and Queensland, but it is not possible to assess this since neither the AER nor the distributors have placed such information in the public domain. The apparent adoption of higher planning standards in both New South Wales and Queensland does not seem to have had a measurable effect on the quality of services (the frequency and duration of outages) provided by distributors in these states. In this sense, while it might be agreed that apparently higher network planning standards might have driven greater expenditure by distributors in New South Wales and Queensland, the merits of this higher expenditure seem unclear.

In summary, the adoption of higher planning standards by some jurisdictional governments appears to have led to higher costs, but with no discernible impact on the

quality of service. These apparently higher standards have not been subjected to any form of public economic assessment or critique. The adoption of apparently higher planning standards can thus explain some part of the higher prices and lower productivity amongst government owned distributors.

4.5 Asset valuation

Figure 8 showed that the value of the regulatory asset base per customer in government owned networks has expanded rapidly over the last decade and is projected to continue to do so in the remaining four years of this regulatory period. By 2014/15 the value of the asset base per customer in government owned distributors will be around three times higher than it is, per customer, in privately owned distributors.

When valued in terms of asset base per kilometre of line or cable in 2014, government owned distributors will have assets that are valued a little under twice as highly per kilometre as those of privately owned distributors.

Part of this difference may be explained by asset age – the government owned networks are newer and hence may be more highly valued than the privately owned networks. Part of the difference may be differences in the definition of transmission compared to distribution, although such differences between private and government distributors are not obviously apparent. Part of the difference may also be related to ownership. Governments that own distributors continue to profit from that ownership and have an incentive to value distributor assets more highly since this improves profitability. The governments of jurisdictions that have privatised distributors are likely to be more intent on lower asset valuations since this reduces prices. This is because the governments in jurisdictions that have privately owned distributors are not trading off the political disadvantage of higher prices for higher dividends and taxes.

Other evidence of different attitudes to asset valuation in private and government owned distributors is apparent in the valuation of easements. Government owned distributors claim $1.39bn[68] worth of land for easements in their regulated asset bases. They will recover at least $693m over five years from electricity users as result of the valuation of these easements in the regulatory asset base[69]. By contrast, privately owned distributors in Victoria attach no value to the easements they use, in their regulatory asset bases, and in South Australia a significantly lower value has been attached to easements than in New South Wales or Queensland.

Another significant difference in asset value can be observed by comparing the value of the regulated assets per kilometre in Britain, to those in Australia. This comparison shows that British distribution networks are valued by their regulator, per kilometre of line, around half as much as Australian distribution networks. [70]

However around 60% of the British distribution network is underground and it has almost no single wire earth return line[71]. By comparison in 2008, 24% of the Australian distribution network was inexpensive single wire earth return, and just 14% of the total network was underground.[72] Underground networks are at least 10 times more expensive to construct and maintain than above-ground networks. For example, the Independent Panel suggested it would cost $50bn-$60bn to "underground" the Queensland distribution networks. This compares to the existing (above-ground) network which at the time of the Independent Panel's inquiry was valued at $6bn[73]. This suggests that British distributors should be very much more highly valued – per kilometre of network - than Australian distributors, while the data shows the opposite to be the case.

In summary, the valuation of regulated monopoly assets is complex and subjective, but very significant in the determination of regulated revenues since the returns on the regulated asset base is typically by far the most significant element of regulated prices/revenues. The fact that government owned distributors are valued so much higher per kilometre of line than privately owned distributors suggests that ownership has affected asset valuation. This may therefore explain, in part, the outcomes described in Section 3.

4.6 Allowed rates of return

To what extent is rising distribution revenues explained by allowed rates of return, and to what extent do allowed rates of return explain higher distributor prices in Australia than in Great Britain?

Dealing with the first question, as described in Section 2, the regulatory model entails the regulator determining the weighted average cost of capital as the basis for the calculation of the returns that distributors earn on their regulated assets. The AER has set a higher allowed rate of return than the jurisdictional regulators had previously set. The main reason for this is a debt risk premium that is around three times higher than the jurisdictional regulators had set[74].

The debt risk premium is the premium on top of the risk free rate, and is intended to provide compensation to lenders for accepting the risk of default in their loans to

distributors. The AER has recognised that the debt risk premium that it has set in calculating the allowed returns results in an allowance for debt costs that is higher than the actual cost of debt to distributors. Nevertheless the AER contends that it would be contrary to the National Electricity Objective (the long term interest of consumers) for the debt risk premium to be based on a benchmark of distributors' actual debt costs, as for example the British regulator, Ofgem, does.[75] It is not clear why the AER believes this to be the case.

Dealing with the second question – higher allowed rates of return in Australia than in Great Britain - Mountain and Littlechild (2010) contrasted the "vanilla" cost of capital (in real terms) of around 7.5% in Australia, compared to 4.75% in Britain. Most of this difference is explained by differences in the cost of debt that Ofgem calculated in Britain, and that the AER has calculated in Australia[76]. On a total regulatory asset base in 2010 in Australia of $45bn, this difference in allowed returns means that in 2010 distributor revenues were $1.2bn higher (or 17% of total allowed revenues) than they otherwise would be if the British cost of capital (adjusted for differences in the risk free rates in Britain and Australia) was used.[77] In other words, distribution network prices in Australia would be about 17% lower, if the AER had determined an allowed rate of return (adjusted for differences in risk free rates) that Ofgem had determined.

In summary, the higher allowed rates of return determined by the AER explains a significant part of the reason for rising distribution prices in Australia, and is part of the explanation of higher distribution prices in Australia than in Great Britain.

4.7 Customer density

Figure 13 on page 13 showed the Australian distributors earning revenues per customer that are two to four times the levels of distributors in Britain. In relation to the comparison of the performance of British distributors to NSW and VIC distributors, Mountain and Littlechild (2010) concluded that the main reason for these differences do not seem to be geography, operating environment or industry structure.

The Energy Networks Association (ENA) questioned this conclusion. It said that " … *Mountain and Littlechild passed over important facts such as that NSW is nearly four times larger than Britain and the latter is at (sic) around 28 times as dense in population terms*"[78].

Mountain and Littlechild (2010, page 4) did note the differences in customer density between distributors in NSW and Great Britain. They suggested that if this difference in customer density was a significant factor explaining differences between NSW and GB

then it might be expected that this would be reflected in higher costs for Essential Energy – which covers about 95% of the land area of NSW – compared to its metropolitan peers Ausgrid and Endeavour Energy who operate much more dense networks in the metropolitan areas of Sydney and surrounds. However, they noted that Essential Energy's asset base per customer served is actually 8% *lower* than the average of the two urban distributors. This suggests that differences in customer density between NSW and GB are unlikely to be a significant explanatory factor.

We extended the Mountain and Littlechild analysis by examining the correlation of the customer density (number of customers per square kilometre of area of supply) with expenditure levels (capex and opex per customer). We also analysed the correlation of network density (number of customers per kilometre of network) and expenditure levels. At face value, it might be expected that expenditure would be correlated with customer density and network density: surely longer, sparse networks cost more to develop and operate per customer than dense networks? However, our analysis of this amongst the 11 Australian distributors, and also amongst the 14 British distributors showed that there is no meaningful correlation between customer density or network density and expenditure levels[79].

The explanation for this outcome, which may seem counter-intuitive at first, lies in the type and cost of networks that serve dense urban areas compared to those that serve sparsely populated rural areas. In rural areas single wire earth return networks are common. This is inexpensive infrastructure consisting of a single wire strung, typically, on a wooden pole. In urban areas where land and amenity is more valuable, and high levels of reliability are more important, underground cables and more sophisticated (and expensive) meshed networks are common[80]. In Australia (and Great Britain) the greater length of country networks per customer seems to be largely offset by the greater value of urban networks per customer. For example, in Australia in 2014, the regulatory asset base for metropolitan networks will be $6 512 per customer while the value for country distributors will be $6 970 per customer[81]. Figure 7 showed that while the operating expenditure for country distributors is higher than for metropolitan distributors, this accounts for less than a quarter of total expenditure and hence the difference in this is not significant.[82]

The conclusion from this is that the relative differences in customer density amongst distributors in Australia, or between distributors in Great Britain and Australia does not explain higher costs in Australia.

4.8 Ownership

This paper has compared the outcomes delivered by government and privately owned distributors. It has found that those differences are systematic: all government distributors appear to be delivering approximately similar outcomes, while all private distributors appear to be delivering approximately similar outcomes. This is evident in the benchmarking outcome shown in Figure 12 and in the other results shown in Section 3. As such, the data suggests that ownership is a significant variable explaining outcomes. Mountain and Littlechild (2010) suggest that ownership has had an effect on efficiency and prices in three ways:

1. **Incentives to efficiency:** Privately owned companies can be expected to be more interested in maximising profit, and therefore more responsive to regulatory incentives that reward reductions in opex and capex. Government owned companies, while not indifferent to profit, can be expected to place greater weight on non-pecuniary pressures (including from consumers, employees, suppliers, politicians, government and the media). This is likely to make them more cautious about cutting manpower and other costs, and more sympathetic to increasing capital expenditure.

2. **Regulatory framework and implementation:** A government that is also an investor, as the owner of a regulated company, and as the recipient of its tax revenues, has an additional (financial) interest in the profitability of that company. It is more receptive to a regulatory framework that continues to provide such revenue streams. It also has a financial interest in limiting the extent of regulatory power and discretion and how this is exercised, especially with respect to the severity of the price control. This issue in examined in greater detail in Section 4.9.

3. **Financial incentives:** The target rate of return in the public sector is typically less than in the private sector. This, combined with the taxation of distributor profits by state governments (through the redistribution of federally collected income taxes), means that an allowed return that is above the companies' target rate of return makes capital expenditure by government owned businesses in the NSW distribution networks particularly attractive to the distributors.

The last of these points is particularly significant and merits further attention. Effectively, the suggestion is that the regulatory framework provides a financial incentive for government owned distributors to in-efficiently over capitalise (i.e. to

"gold-plate") and through this to expand the dividends and taxes received by their government owners. This proposition can be tested theoretically and empirically.

In theory, the regulatory formulation operated by the AER provides financial incentives for distributors to reduce operating and capital expenditure below the amounts specified in the regulatory control. But, as explained in Box 2 in more detail, the power of the incentive to reduce capitalised expenditure depends on the difference between the rate of return that the regulator allows, and the distributors' actual cost of capital. If, the actual cost of capital is much below the allowed rate of return, distributors' shareholders would be better-off by spending above their regulatory allowances. Government owned distributors' access to low-cost government debt, combined with their taxation of distributor profits suggests that their actual cost of capital is likely to be significantly below the allowed rate of return[83]. This suggests, as explained in Box 1, that state governments that own their distributors are likely to be better off if their distributors overspend the capitalised expenditure allowances that the regulators have used to set price and revenue caps.

The empirical evidence also supports the theoretical conclusion that government owned distributors will wish to increase capitalised expenditures in order to increase profits. The NSW Treasury has projected that dividends and income tax equivalents from its distributors would almost double to $4.4bn over the period from 2010 to 2014, compared to $2.4bn over the period 2006 to 2010.[84] The NSW Treasury specifically attributed the rise in dividends to higher capital expenditure and the consequential expansion in the regulatory asset base, that followed the AER's price control decision[85] (the AER provided the NSW distributors with a capitalised expenditure allowance of $13.1bn for the period 2009 to 2014[86], more than double the allowance ($5.9bn[87]) that the previous jurisdictional regulator, IPART, had determined for the five years from 2004 to 2009).

Other evidence can be seen in the businesses' actual performance compared to their regulatory allowances: over both completed regulatory periods, government owned distributors in NSW and QLD have consistently spent more than their regulatory allowances, particularly in respect of expenditure that is capitalised and hence added to the regulatory asset base. By contrast, privately owned distributors in SA and VIC have consistently spent less than their regulatory allowances particularly in respect of non-capitalised (operating) expenditure where the most powerful efficiency incentives apply.

Box 1: Are government owned distributors better off if they overspend their regulatory allowances?

Incentives affecting capitalised expenditure

Under the price/revenue cap regulatory model operated by the AER, prices/revenues (as the case may be) are capped for the duration of the five year regulatory control periods. The annual capped prices/revenues is based on a forecast of the value of the regulatory asset base (RAB) for each year of the regulatory control period. This forecast is in turn dependent on the forecast level of capitalised expenditure for each year of the regulatory period. At the end of the regulatory period, the regulator revises this regulated base based on the depreciated value of the actual capitalised expenditure during the regulatory control period. This method of establishing the RAB provides incentives on distributors to reduce their capitalized expenditure during the control period. This is because if they do this, the distributors retain the allowances for depreciation and return on assets associated with the (higher) level of capitalised expenditure that the regulator had forecast. The power of this incentive (i.e. the proportion of the saving that the distributor retains) depends on the year in which the saving is made, and the life of the asset. Roughly 35% of the saving will be retained by the distributor if the saving is made in the first year of the regulatory control period, while just 3% will be retained for savings made in the last year of the regulatory control period. If distributors overspend their regulatory allowances then they will be exposed to symmetrical losses on that overspend.

However, a full understanding of the efficiency incentives needs to take account not just of losses/gains on overspending/underspending during the regulatory period, but also how distributors will value a larger RAB if the distributor's actual cost of capital is less than the rate of return that the regulator allows for in the price control. If the allowed rate of return is greater than the actual cost of capital, then distributors will want to expand the RAB since this will deliver rents (profits above their cost of capital) for the life of the asset. If the losses that distributors face during the regulatory period on spending above their capitalised expenditure allowances (i.e. the depreciation and return on the overspend) are less than the income from a bigger RAB at the end of the regulatory period, then it would be financially advantageous for them to expand the RAB as much as they can.

This paper has suggested that the cost of capital for government owned distributors is substantially below the rate of return allowed by the AER. As such, in theory, governments are able to increase the profits they derive from their distributors by encouraging them to expand their RAB as much as they can, even if this means that they overspend the allowances that the AER made to set price or revenue caps.

Incentives affecting operating expenditure

Efficiency incentives on operating expenditure under the AER's controls are more straightforward. Essentially, every dollar of operating cost saving that is made during the regulatory period is captured by the distributor. This is a more powerful efficiency incentive than applies to capitalised expenditure, where distributors only retain, at most, 35 cents in the dollar of any expenditure reductions. This implies that distributors have a stronger incentive to control operating expenditure, or at least to capitalise operating expenditures so that the overspend shows up as capitalised rather than operating expenditure. The evidence that government distributors have typically not overspent their operating expenditure allowances (and the private distributors have typically substantially underspent their opex allowances) accords with this understanding of the theory.

In summary, government distributors have received significantly higher expenditure allowances than their privately owned peers. The government distributors have nevertheless typically overspent these higher allowances. This seems to be well explained by government ownership

and the consequences of this for incentives to efficiency, the impact of ownership on the design of regulatory frameworks and financial incentives.

4.9 Regulatory design and conduct

Up to this point, this chapter has examined a variety of factors that could explain the outcomes presented in the previous section. So far, little attention has been paid to the design of the regulatory framework, and the conduct of the regulator within that framework. Mountain and Littlechild (2010) identified three issues of regulatory design and conduct that may be part of the explanation of rising costs in Australia:

- The onus of proof;
- Asymmetric appeal against regulatory decisions;
- The limited use of benchmarking by regulators.

This sub-section expands on the Mountain-Littlechild analysis of these issues.

Onus of proof

The regulatory arrangement established in the National Electricity Rules is that distributors propose the price/revenue control that should apply to them, and the AER's task is to respond to their proposals to determine price/revenue caps for the control period. This is known as the "propose-respond" doctrine. The AER is required to start from the assumption that the distributors have proposed expenditure levels that satisfy the National Electricity Objective (acting in the long term interest of consumers), because this is what they are required to do under the National Electricity Rules.

If the AER rejects the distributors' application it is required to justify in detail why it has rejected it, and provide the detail of its own calculations to justify its determination of the correct allowance (clause 6.12.2.ii). In other words, under the propose-respond doctrine, the onus of proof rests with the AER to prove to the distributors they have not proposed an efficient level of expenditure, rather than for the distributors to prove to the AER that they have. This is a very importance difference.

The propose-respond doctrine was introduced in 2006 in the Review of Chapter 6 of the National Electricity Rules. It was the first major review undertaken by the then newly created Australian Energy Markets Commission (AEMC). At the time, the AEMC described the propose-respond model as "*purely a procedural mechanism … (that) is not intended to extend to the regulatory decision making criteria that apply to different elements of the overall regulatory model.*" [88]

However, the Australian Competition Tribunal (ACT), in an appeal by one of the distributors provided a very different description of the propose-respond model. In particular, the ACT defined the proposed-respond doctrine as follows[89]:

1. Distributors must provide expenditure forecasts in accordance with the National Electricity Objective as described by the three criteria in the Rules;

2. The AER must accept the distributor's forecast if it is satisfied that the total of the forecast reasonably reflects the three criteria;

3. It is not the AER's role to make a decision it considers best … the AER should be very slow to reject a distributors' proposal if it is backed by detailed, relevant independent expert advice because the AER, on an uninformed basis, takes a different view;

4. The AER must not reject such a proposal merely because it has an expert opinion. The AER, based upon any expert advice, needs to make its own evaluation, an evaluation that is reviewable by the Tribunal.

At first sight this seems to establish a reasonable constraint on regulatory decision-making and as such sets an appropriate level of regulatory accountability. However, closer inspection suggests that this arrangement puts the regulator at a considerable and unfair disadvantage. The doctrine assumes that distributors will provide expenditure forecasts that reflect efficient expenditure simply because they are told to do this. This is naïve, considering the financial incentives that distributors, and their owners are provided with under the price/revenue cap regime.

If the same doctrine was applied in the assessment of income tax for example, companies would be liable to an obligation to pay a fair level of income tax and would propose to the tax office what this would be. It would then be up to the tax office to prove that they have not done so. Furthermore if tax officials chose to dispute the assessment, they would be precluded from undertaking their own assessment, and instead would be constrained to prove that the claims made by the company were wrong.

From this it should be clear that the propose-respond doctrine substantially improves the bargaining position of distributors relative to that of the AER, as it is intended to

do. Mountain and Littlechild (2010) noted that it was the adoption of this doctrine that was helpful in persuading some states, particularly those that owned electricity distributors, to transfer regulatory authority over its distributors from jurisdictional regulators to the AER.

Although the AER has vigorously defended the decisions it has made under the propose-respond doctrine, it did raise concerns, albeit obliquely, about the effectiveness of this doctrine before the doctrine was introduced in 2006. [90]

The propose-respond doctrine in Australia can be compared to the arrangements in Great Britain where it is the regulator, not the distributors, that propose the regulated prices. In developing its proposal, it is the regulator, not the distributors, that sets the agenda for the review and decides what information it would like the distributors to provide. The regulator makes up its own mind on how they wish to analyse that information. At the end of the review, it is the regulator that makes a final proposal to the distributors. The distributors are free to reject the regulator's proposal and if so the decision is referred to the Competition Commission. Distributors are exposed to the risk that the Competition Commission may make a less generous decision than the regulator had proposed. So far the British distributors have appealed only one price control decision by Ofgem (out of the 48 that it and its predecessor had made).

This approach applied in Great Britain (with the exception of the appeal mechanisms) is akin to the one that was applied by jurisdictional regulators in respect of electricity distribution and by the ACCC in respect of the regulation of transmission networks, before the propose-respond model was introduced by the AEMC as part of the Chapter 6A rule changes in 2006.

It is instructive to examine how the propose-respond doctrine has been implemented by the AER in practise. In 2009 and 2010, the AER made four regulatory decisions. These decisions set the maximum weighted average prices for distributors in NSW, VIC and SA, and maximum allowed revenues for distributors in Queensland. The AER assessed that it would be efficient if these distributors spent $48.5bn (in 2010 dollars) over the five year regulatory control periods currently under way. Regulated prices and revenues were set based on this assessment.

In assessing the level of efficient expenditure, each of the distributors made proposals to the AER on what it thought the right level of allowed expenditure should be. Each of

these proposals were typically thousands of pages long and the distributors each commissioned many expert consultants to support the views that they submitted.

The AER then assigned economists on its staff, in teams of five to ten per distributor, to review those proposals. The AER also retained engineering consultants to assist its staff. The AER's expenditure review typically lasted around three months per distributor and involved many meetings of the AER's staff and their consultants with the staff of the distributors and their consultants.

The AER's approach was to assess the proposals that had been made to them through what the AER called forensic "bottom-up" assessments. This meant that AER staff would assess the proposals by examining in detail the many constituent elements of the proposal, and it would then establish its own assessment by building up the total budget on the basis of its assessment of its many constituent elements.

In doing this, AER staff would decide the efficient level of expenditure on all the many assets and activities of these distributors. This would mean decisions on the budgets for motor vehicles, expenditure on offices and other buildings, the number, type and cost of transformers, the wages bill, the budgets for computers, telecommunications, keys and locks and so on.

The AER then sets out its views on these issues in draft decisions that were typically thousands of pages long including appendices. The distributors then responded to this by pointing out to the AER where they think it is wrong. The distributors then submit revised proposals which the AER would then reassess in arriving at its final decision, which again would run into thousands of pages. Box 2 illustrates this approach with respect to the AER's decision on the budget for locks and keys for Ergon, a Queensland distributor, as an example of how this works in practice.

The distributors then consider the AER's final decision and decide whether to appeal those elements of the decision that they do not like, to the Australian Competition Tribunal (ACT). All four distribution decisions by the AER have been appealed to the ACT as have the three transmission decisions made under the current version of the National Electricity Rules. In short every AER decision made under these Rules has been appealed by the regulated businesses involved.

Through this "bottom-up" approach, a few of economists from the AER supported by one or two consulting engineers are given a few months to undertake a detailed

forensic assessment of five years' worth of expenditure - $48.5bn in the most recent reviews - by eleven monopolies. These monopolies, it should be remembered, have strong incentives to make ambit claims, are able to command high levels of resources to persuade the regulator to their view, and of course know far more about their business than the regulator ever could.

Box 2: "Propose-respond" in action: the AER's assessment of the budget for locks and keys

In its regulatory proposal to the AER, Ergon Energy proposed an allowance for expenditure on 300,000 locks and keys. The AER asked its consultants, PB Associates to assess this claim. As a result of this, Ergon revised its budget for locks and keys and provided "a business case" for this expenditure including an "options analysis". PB Associates then assessed this claim by examining the number of locks per kilometre of track, and the number of keys to be provided. At the end of its review, PB Associates concluded that the scope of works was transparent and the cost estimate was well supported and so it decided that the revised budget for locks and keys was prudent and efficient. The AER then concluded that Ergon Energy provided a "well substantiated" forecast for its revised keys and locks program in its revised regulatory proposal and so it accepted Ergon's revised proposal. The lock and key budget was less than 0.2% of the total allowed expenditure by Ergon during its regulatory period.[91]

Asymmetric appeals against regulatory decisions

Price or revenue control decisions by the AER may be appealed to the Australian Competition Tribunal (ACT) on their merits — by the distributor or by its consumers or their representatives. A distributor may choose to appeal specified individual elements of a price control decision, without affecting other elements of the decision. That is, only those elements forming the grounds for the appeal are heard by the ACT, leaving the remainder of the decision untouched This encourages cherry picking. Moreover, if the Tribunal finds against an applicant, the AER's decision stands. This means that an appeal by a distributor is very unlikely to result in a less favourable outcome for it. The worst outcome would be that the original decision stands.

The appeal arrangements are also asymmetric in the sense that while both distributors and energy users are able to apply to appeal AER decisions, distributors enjoy much easier access. This is because the financial resources required to appeal are considerable. Funding is required for economists, barristers and solicitors and other specialists. The benefit of successful appeals for energy users will be distributed amongst the body of energy users, while a successful appeal by a distributor will be captured by that distributor or other energy network monopolies (eg those joined to the appeal or that will derive benefits from it in subsequent AER decisions). This makes it very much more difficult for energy users to raise the funds to run an appeal.

In addition, distributors record their appeal costs as part of their operating expenditure. The AER has generally assumed that the observed level of operating expenditure is efficient (on the basis of the supposed regulatory incentives for efficiency). It has therefore used historic operating expenditure as the basis for the determination of operating expenditure allowances in the following regulatory periods. This means that, even if a distributor loses an appeal they can at least look forward to recovering the costs of their appeal from energy users through higher operating expenditure allowances in future regulatory periods.

The asymmetries of the appeal mechanism probably also encourage the AER to err on the side of the distributors in their regulatory decisions, as a way to mitigate the risk that their decisions will be appealed. In conjunction with a propose-respond doctrine that placed the onus of proof onto the AER and has encouraged the AER to adopt a forensic "bottom-up" approach to the assessment of efficient expenditures, the asymmetric appeal mechanism has weakened even further, the AER's ability to make decisions that reflect best practice economic regulation and are informed by broader judgments of company efficiency and economic incentives.

Benchmarking

Benchmarking in the economic regulation of electricity and gas network monopolies, water companies, rail operators and airports has been an important tool in establishing efficiency incentives. For example, in a survey of the use of benchmarks in economic regulation in 40 countries (Pollitt 2009, page 32)[92] concluded that "*only a small number of regulators do not use or are not actively considering the use of advanced benchmarking techniques in analysing the efficiency of gas and electricity network companies.*"

Whereas in competitive markets, producers are informed by their consumers and their competitors about their competitiveness in the market, for monopoly industries there are no competitors to provide such information and consumers are not able to exercise choice. In this context being able to establish measures of efficiency through comparison becomes very valuable both as a management tool, and also setting regulatory targets.

Under the National Electricity Rules (clauses 6A.6.6(e)(4) and 6A.6.7(e)(4)) the AER has an obligation to have regard to the "benchmark efficient operating and capital expenditure" in deciding distributor expenditure allowances.

So far, the AER appears to have made limited use of such benchmarks, describing them as little more than a "*top down test of more detailed bottom-up assessments*"[93]. For operating expenditure – which is less than a quarter of distributor total expenditure - the AER has developed some limited benchmarks of historic expenditure, but not the expenditure that the distributors have proposed. In the case of the revenue and price control decisions for the Queensland and New South Wales distributors respectively, the AER dismissed its own benchmarks which showed distributors in these jurisdictions as significantly less efficient than their peers.[94] Furthermore the AER has not applied generally-accepted benchmarking techniques in assessing the efficiency of capitalised expenditure – the remaining three quarters of the expenditure that distributors incur.

The AER's approach to benchmarking operating and capital expenditure – where it has specific obligations under the NER to have regard to benchmarks - can be compared to its approach to the determination of the allowance for equity raising costs, where it has no specific obligation to use benchmarks. In the case of equity raising costs, the AER has adopted a sophisticated benchmarking methodology to determine equity raising costs – including for government owned distributors who incur no such equity raising costs.

The AER has defended the low importance it has placed on expenditure benchmarks on the basis that the data needed to compile benchmarks is not available. But the AER has had the authority to gather such data in order to benchmark expenditure by transmission network service providers (over which it has had regulatory authority since 1999) or distributors (over which it has had regulatory authority since 2006).

The AER's approach to benchmarking can be compared to the approach adopted by Ofgem in Britain. Ofgem has applied benchmarks to set expenditure allowances since its first distribution price control review in 1995. The benchmarks are used to determine expenditure allowances for recurrent expenditure (a large proportion of which is capitalised) which constitutes around two-thirds of distributor expenditure. The application of the benchmarks result in the least efficient distributors receiving the toughest expenditure controls, in order to force them to catch up to their more efficient peers. By contrast in Australia where benchmarks are not used, our analysis in Figure 11 showed that the least efficient distributors have been granted the highest expenditure allowances by the AER. In other words, the failure to apply benchmarks is at least part of the explanation why the least efficient distributors in Australia have fallen even further behind.

It might be argued that the propose-respond doctrine means that the AER has limited ability to use benchmarks to set expenditure allowances. Specifically, according to the ACT's description of the propose-respond model, if a distributor does not propose benchmarks to set expenditure allowances, the AER would not be in a position to use benchmarks to set expenditure allowances. Unsurprisingly, none of the government owned distributors have proposed that benchmarks be used to set expenditure allowances, whereas the privately owned distributors in SA have typically referred to benchmarks to justify the efficiency of their expenditure claims.

The AER has discretion to decide the importance it places on the various factors it is required to have regard to in setting expenditure allowances. As such, the AER has discretion to decide whether benchmarking should have greater value than just as a "top-down test". Perhaps in view of the extraordinarily large expenditure claims it has faced, particularly from government owned distributors, the AER could reasonably have been expected to do significantly more in this area.

4.10 Summary of the assessment

This section has examined numerous possible explanations for the increase in distribution costs in Australia. It has concluded that the commonly-cited explanations: rising demand, ageing assets and the need to catch up for historic underinvestment do not seem to be plausible:

- Demand-related expenditure has been poorly correlated to demand growth. Ownership differences combined with flaws in the regulatory framework and governance arrangements seem a more plausible explanation - government owned distributors are being allowed to charge their customers four times as much to meet rising demand as their privately owned peers;
- Expenditure on ageing assets is also uncorrelated to the remaining life of assets. Again, ownership and regulatory failure is a better explanation. Government owned distributors are being allowed to charge users four times as much to replace ageing assets, than privately owned distributors, despite the fact that the average remaining asset life of government owned distributors is 31 years compared to 21 years for privately owned distributors;
- There is no evidence of historic underinvestment by NSW distributors. To the contrary, the evidence suggests historic over-investment. In Queensland, the case of historic underinvestment is at best debatable.

The report examined other possible explanations for rising expenditure including higher network planning standards, asset valuations, allowed rates of return,

ownership, regulatory design and regulatory implementation. It concluded that these provide plausible explanations for rising costs:

- The Queensland and New South Wales, governments have set higher planning standards which has led to higher expenditure. There does not seem to have been any case for this on the basis of service performance. Furthermore, despite the higher standards the service performance of government-owned distributors shows no meaningful change;
- Government owned distributor assets are valued three times higher per customer and twice as high per kilometre of line as those of privately owned distributors. This explains higher charges for depreciation and return on assets by government owned distributors;
- The onus of proof established through the propose-respond doctrine, and the arrangements to appeal AER decisions, are undermining the AER's ability to set expenditure allowances that reflect efficient expenditure;
- More can be made of expenditure benchmarking, as already required under the National Electricity Rules to tighten expenditure allowances particularly for high cost government owned distributors.

Finally, with respect to the comparison of distribution costs in Great Britain and those in Australia, the analysis shows that lower customer density in Australia does not explain these differences. Rather, differences in asset values, allowed rates of return, the regulatory framework (onus of proof) and approach to benchmarking explain significantly higher costs of electricity distribution in Australia, compared to Great Britain.

5 Reform options

The analysis in this paper concludes that the problems that have led to wasteful expenditure by government owned distributors in particular, are deep-seated and complex. Simple explanations such as rising demand, ageing assets or historic underinvestment ignore these problems and therefore are not capable of addressing them.

The rewards from a thorough reform should be significant. For government owned distributors to catch up to their privately owned peers would mean cutting their expenditure in half. This would not have a significant effect on prices in the short term, since the backlog of past expenditure will still be weighing on consumers. But in the longer term, raising distributor efficiency will result in dramatic electricity price reductions.

If distributors in Australia achieved the investment and operational efficiency, per unit asset valuations and rates of return of British distributors, distributor prices will be around one quarter of their current levels in New South Wales and Queensland. Price reductions to end consumers in 2011 of around 39% in these states would be possible. In Victoria and South Australia, price reductions of around 29% would be possible. Furthermore, lest it be thought that the British distributors are being held up as an unreasonable benchmark, it is should be noted that Ofgem, the British energy regulator, noted that British distributors are somewhat less efficient than comparable distributors in the United States of America.[95]

Major policy and regulatory reforms will be needed to improve the efficiency and productivity of the distribution sector in Australia. Most of the changes we suggest are not mutually exclusive. Considerable thought is needed to decide priorities. We propose these options for further consideration.

5.1 Policy reforms

Privatise

The evidence presented in this paper is that ownership is a significant factor affecting efficiency: privately owned distributors in Australia are significantly more efficient than their government-owned peers. This suggests that privatisation of the distributors in New South Wales and Queensland offers the prospect of significant productivity gains.

The issue of network business ownership is frequently discussed in Australia. In these discussions, ownership and regulatory framework are often described as independent of one another. Our view, as set out in Section 4.8, is that ownership and regulatory framework are strongly linked. Privatisation will diminish the distortions in the design and implementation of the regulatory framework, that are attributable to the financial interest that jurisdictional governments in NSW and QLD currently have in their distributors.

Privatisation without effective regulatory control is likely to increase the prospect of profiteering and service degradation. There is significant experience of effective regulation of privatised network monopolies in Victoria and elsewhere that can be drawn upon to ensure effective regulation.

Review the "competitive neutrality" assumption in application to network monopolies

The doctrine of competitive neutrality has its origins in the micro-economic reforms in Australia from the mid 1980s. The idea underlying this doctrine is that government owned businesses that provide services in competition with privately owned competitors should not be able to derive a competitive advantage (for example through preferential access to markets or preferential access to finance) through government ownership.

However the doctrine has been appropriated in the economic regulation of network monopolies, including distributors, despite the fact that such monopolies do not compete with one another. In network monopolies, the application of this doctrine has meant treating government owned distributors as if they are privately owned ("neutrality" as the term is generally understood is clearly a misnomer in this context). This has meant government owned distributors being allowed to charge their users on the basis that their cost of capital is the same as it is for their privately owned peers. This is despite the obvious fact that the government owned distributors have access to low cost funds through jurisdictional government treasuries. In addition, and most importantly, these government treasuries receive not just the dividends from the profits of their distributors, but also the tax on the distributors' profits. As such, the implementation of the competitive neutrality doctrine provides a windfall profit to the governments that own their distributors.

Abandoning the assumption of competitive neutrality for government owned network businesses could lead not just to differences in the allowed rates of return for government and privately owned distributors, but ultimately also to the application of different regulatory models. The price cap regulatory model relies on profit motives to stimulate efficiency improvement. If government owned distributors do not have the same motives for profit as the privately owned distributors (as this paper suggests) then a price cap regulatory form that places heavy reliance on profit motives to stimulate efficiency improvement may be ineffective in driving efficiency improvement in government owned distributors, as the analysis presented in this paper suggests is the case. To achieve efficiency improvement in government owned distributors, alternative regulatory designs should be considered.

Empower electricity users

End users are almost completely disempowered in the current NEM network regulatory process as designed by the MCE and AEMC and administered by the AER. As Section 4.9 discussed, the implementation of the propose-respond regulatory model has meant the regulator attempting to focus "forensically" on many small details – such as the budgets for locks and keys - to determine allowed expenditure levels. Energy users are unable to participate effectively in such a process – they simply do not have the resources to engage effectively at this level of detail (we argued earlier that this approach is ineffective anyway).

Users also do not participate at the many meetings and interactions between distributors and regulators during a price control review. By contrast, meetings between the regulator and electricity users are infrequent and invariably inconsequential.

Distributors frequently claim commercial confidentiality for information they provide to the regulator. This makes it even more difficult for users to scrutinise the distributors' proposals and the regulator's decisions. With a few exceptions, the distributors themselves make little or no effort to engage with users to discuss their regulatory proposals.

While energy users or their representatives have the right to appeal regulatory decisions, in practice as discussed earlier in the paper, the resource requirement to do this has been an insurmountable barrier.

There are several possibilities to empower energy users in the regulatory process. Littlechild (2011), describes the role of the Federal Energy Regulatory Commission (FERC) in regulatory decisions of electricity and gas monopolies in America. Littlechild (2011, page 35) concludes:

"*Settlement is now actively chosen by all parties – utility, customers, interstate and state regulators – in some 90% of all rate cases at FERC. It has been consistently preferred, in essentially its present form, over a period of at least 35 years, and in some form for about 45 years. This is a remarkable record of survival in an activity – utility regulation – that has been characterised by no little reform and change over the last half century*."

Under the "settlement" process adopted by FERC, the role of the regulator is to facilitate negotiation and settlement between the utility, its consumers and other interested parties including state-based public utility commissions. FERC staff implement this role by providing analysis and proposed settlements, within a negotiation framework that leads to litigation if settlement can not be achieved.

The adoption of a negotiated settlement approach in Australia would be a significant change from the current arrangements. We suggest it merits further detailed examination in considering how best to empower electricity users in the regulatory process to assist in the delivery of better outcomes for all parties.

Re-establish jurisdictional regulation

This paper has observed that the regulatory decisions by the AER have been significantly more favourable to the distributors than were the decisions by any of the jurisdictional regulators. It attributed this mainly to the design of the regulatory framework that the AER operates under, and also to the AER's implementation of that framework. It showed that jurisdictional governments are projecting significantly higher dividends and income taxes, following the AER's decisions, than it received under the decisions of its jurisdictional regulators. Jurisdictional governments have not been slow in pointing out that it is decisions by the AER, a federal authority, not their governments, that have accounted for most of the price increases.[96] From the perspective of jurisdictional governments that own distributors, it might therefore be concluded that the creation of the AER has provided the double benefit to jurisdictions of higher financial returns, and the ability to deflect the blame for consequently higher prices, to a federal authority.

The tempting conclusion to draw from this is that the solution would be to transfer regulatory authority back to jurisdictional regulators. We are not suggesting that this is the best solution. Our view is that the other policy and regulatory solutions set out in this chapter should be considered first. However, if meaningful reforms are not achieved in these other areas, then re-establishing jurisdictional regulation of electricity distributors should be seriously considered.

5.2 Regulatory reform

The regulatory reforms described in this sub-section describe a number of significant changes to the National Electricity Law, the National Electricity Rules, and the AER's implementation of those Rules. They are described as regulatory reforms rather than policy reforms, because they can be accomplished without radical change to the existing regulatory framework. They are nonetheless significant reforms and each is likely to have a significant, positive, effect on the efficiency of the sector.

Reduce the allowed rate of return

Section 4.6 compared the rates of return that the AER has used in its decisions to those in British decisions and those in decisions by jurisdictional regulators. It showed that part of the explanation for higher prices is the higher allowed rates of return in Australia, and higher allowed rates of return by the AER compared to jurisdictional regulators.

Reducing the allowed rate of return will affect distributors' willingness to invest: if the returns on offer through the regulated rate of return are less generous, distributors are less likely to want to "gold plate" their assets in order to secure those returns. This is particularly significant for governments that own distributors since their returns are boosted through their receipt of income taxes.

Revalue assets

Section 4.5 explained that distributor assets per kilometre are currently valued twice as highly in Australia as those in Britain. It also showed that the assets of government owned distributors in Australia are rising rapidly and by 2014/15 the value of the asset base per customer in government owned distributors will be around three times higher than it is, per customer, for privately owned distributors.

These higher regulated asset values (in Australia than in Britain, and of government owned distributors in Australia than privately owned distributors in Australia) explain a significant portion of the higher prices. Section 4.5 concluded, asset valuation is

complex and subjective and it is surely not unreasonable to conclude that ownership has influenced valuation. Re-establishing the value of Australian distributor assets, particularly of government owned distributor assets at more reasonable levels will have a significant impact on distributor prices. Accordingly we suggest a major review of asset valuation. This would encompass:

- Valuation methodology including the use of the optimized depreciated replacement cost methodology employed by the jurisdictional governments in the valuation of the distributors' assets at the time that the AER assumed regulatory control;
- The methodology by which the AER indexes the regulatory asset base for inflation;
- The valuation of easements and other land.

Reform onus of proof

The propose-respond model puts the onus of proof on the AER to prove that the distributors' expenditure proposals are not efficient rather than for the distributors to prove to the AER that they are. It has been a significant factor encouraging the AER to follow a forensic "bottom-up" evaluation approach that has, evidently, failed to provide a meaningful check on distributors' expenditure claims. The AER should be responsible for making decisions that accord with the Rules but it should be unrestricted in its ability to assemble evidence as its sees fit. It should be able to reject a distributor's claims on the basis that they have not adequately addressed its concerns. The AER should be subject only to a general requirement to provide reasonable evidence and argument to support its decisions. Similar obligations apply in the regulation of networks in Great Britain and previously in Victoria, New South Wales and Queensland under previous jurisdictional regulators in these states. The AER should be able to draw conclusions based on reasonable inferences about distributors' response to economic incentives and their demonstrated historic performance.

Institutionalise benchmarking

Section 4.9 described the role of benchmarking applied by the AER as a "high level sense check" that has had no meaningful role in its regulatory decisions. The Australian distribution sector is well adapted to benchmarking. There are eleven distributors whose price or revenue control decisions are undertaken in short succession. So far each distributor has undertaken at least two completed control periods and are currently into their third control periods. Account keeping by the

distributors is sophisticated. This provides a rich source of historic data that can be used to develop econometric analyses for benchmarking.

Such benchmarking should become part of the regulatory methodology and should be used to set expenditure allowances for recurrent expenditure (whether it is capitalised or not). The application of this approach will force inefficient distributors to catch up to the benchmark.

Changes to the National Electricity Rules are likely to be needed to ensure that benchmarking is accorded greater status than merely as one of several factors that the regulator is required to have regard to, as it sees fit. Ideally also, it would be advantageous to bring the start of the regulatory period for all distributors covered by the AER into line, so that the benchmarking assessment applies to all distributors based on their expenditure proposals.

Reform the appeal mechanism

Section 4.9 described the appeal arrangements as asymmetrically in favour of distributors rather than users. The arrangements are also likely to encourage the AER to err on the side of the distributors in order to reduce the risk of appeal. The design of an appropriate appeal mechanism requires careful consideration. At the least users and network service providers should enjoy comparable levels of access in practice. There should be no or limited opportunity to cherry-pick decisions. The interests of transparency and accountability need to be weighed up against the need to ensure that the regulator has the discretion it needs to take account of the many valid, but not necessarily quantifiable, factors that determine efficient outcomes.

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Appendix A: Explanation of benchmarking methodology

1. Required data is opex, capex, customer numbers (C), peak demand (D) total energy distributed (E), network length (N).

2. In the case of the 2nd regulatory control period, large amounts of the most recent year's data (2010) is missing, therefore the entire year is ignored, leaving 4 years x 11 distributors = 44 datapoints.

   In case of 1st regulatory control period, 2001 QLD and ETSA opex and capex data is missing. Only these 3 data points are removed. Leaving 5 x 11 – 3 = 52 points.

3. Test for covariance of the 4 independent variables. This is done by placing each variable in turn as the dependent variable and regressing against the remaining three. The results for the 2nd control period were as follows:

	Dependent Variable			
	Customer	Energy	Demand	Network
$1-R^2$ (tolerance)	0.06	0.03	0.02	0.89
VIF = 1/tolerance	17.18	32.61	48.44	1.19

   Whether variables are collinear or not is not clear-cut and is subject to interpretation. A tolerance of less than 0.20 is grounds for concern. Less than 0.10 indicates fairly certainly that the amount of collinearity is unacceptable. Clearly all 3 of C, E and D are highly correlated. The solution is to drop 2 of these 3 variables. The choice to drop E and D is based on:
   - All three of C, D and E demonstrate a high degree of collinearity therefore the choice doesn't really matter
   - Practical consideration that the C data are more available and reliable

4. Regress totex (total expenditure) as the dependent variable and C and N as the independent variables. This regression can be done in Excel using the Regression add-on. Ensure that the y-intercept is 0 (so that there isn't a negative y-intercept, implying negative efficient opex for small companies). The important output of this is the coefficients of each of the independent variables.

a. For each line of data, multiply actual C and actual N by the C coefficient and the N coefficient respectively
b. Sum these 2 to get a Combined Scale Variable (CSV) for each line of data
c. Find the percentage composite of C and N in the CSV for each line of data (for interest only)
d. Find the average percentage composite of C and N in the CSV (for interest only)

5. Plot a graph of CSV (x-axis) against opex (y-axis).

    a. The coefficients returned by the regression are calculated as such that the linear line plotted through the points by the standard excel graph trendline (with y-intercept = 0) minimises the sum of the residuals (i.e. the vertical distance between the points and the line is smallest in aggregate).
    b. The coefficients are such that the weightings of the 2 independent variables result in the sum of the residuals being minimised. The regression gives relative weightings to each of the independent variables given their correlation to opex. A poorly correlated variable will therefore make up less of the CSV (x-axis) than a strongly correlated variable. If a spurious and irrelevant independent variable were to be included in the analysis which was not correlated to the dependent variable (opex) its weighting would be 0 (or very close to it).

6. Add a trendline fixing the y intercept to 0.
    a. The trend line should have the equation y = x (i.e. in the standard equation y = mx + c, m=1, c=0). Although the coefficients' relative weightings to each other are crucial in this analysis, their absolute number is arbitrary (i.e. both coefficients could be doubled or tripled without affecting the size of sum of the residuals (which is minimised)). Excel therefore dictates that the size of the coefficients is such that the trendline has a gradient of 1.

7. As the y intercept is set to 0 and the slope of the graph is 1, the CSV is such that it is equivalent to median predicted opex. Determine the actual totex : median predicted totex ratio (actual totex : CSV) for each line of data.

8. Rank the data and, taking the top 50% (rounding up to be generous) replot on the same graph another best fit trendline (y intercept =0). The top 50% is such that, when the new trendline is plotted, half these 50% (i.e. 25% of the total) are below the line and are better than "efficient". Selecting the top half gives an efficiency frontier at the upper quartile.

9. Multiply the slope of this new line by the CSV to give a predicted efficient opex for each line of data.

10. Get the ratio of actual totex : predicted efficient totex. Normalise this around 0 by subtracting 1 off each ratio (therefore a figure of >1 means inefficient, <1 means better than efficient). Average this for each distributor over the control period and express as percentages. Plot this graph. The normalised ratio can be interpreted as follows:
    - A figure of -100% means that the company is spending 100% too much (i.e. twice as much) than it is predicted to if it was efficient).
    - A figure of 100% means the company is spending half the level of expenditure of a firm on the efficient frontier.

Appendix B: MCE comments and author's response

This appendix sets out comments on fact, data and consequential analysis provided to the author by the Ministerial Council on Energy, in an earlier draft of this report. The funding agreement between the EUAA and the Consumer Advocacy Panel – which has partially funded this report - enables the Author to reject comments provided by the MCE, but requires the Author to explain why. This appendix fulfils that requirement.

For ease of reference the page numbers have been changed to be consistent with this final report, whose page numbers differ from those in the earlier report provided to the MCE

	MCE Comment	Author's response
1	Page vi. First dot-point says demand and customer numbers have grown "far more strongly" in Victoria than in Queensland or New South Wales. This is not supported by the paper itself (see Fig 13 and the second paragraph of section 4.1 for demand.	We disagree. We think the MCE may have mistaken the rate of demand growth (which was set out in Figure 13) for the absolute value of demand growth (which is set out in Figure 14). Accordingly, we submit that the first dot point alluded to is supported by the paper itself.
2	Page vi. Second dot-point states that difference in average remaining life of assets should result in a particular difference in the requirement for asset replacement. This does not necessarily follow – it all depends on the age profile of the assets underlying the quoted averages.	We agree that it does not necessarily follow, but this does not undermine the validity of the analysis and so no change has been made. The average remaining asset life is a weighted average calculation based on the asset mix contained in the Post Tax Revenue Model and so takes account of the age profile of the total portfolio of assets. A comparison of the remaining life calculated on this basis is, we suggest, appropriate unless there is a significant asymmetry in the asset age profile of the assets of government and private distributors. In other words, a conclusion based on the weighted average remaining life of government and private distributors would be invalid if government owned distributors have a large preponderance of fully depreciated assets (and hence are given a low weight in the calculation of remaining life) that need to be replaced, while the privately owned distributors do not. We see no reason to believe that such an asymmetry exists. For the avoidance of doubt this text has been included in a footnote in this section.
3	Page vii. In Asset Valuation it is stated most government-	Wording has been altered to reflect this, but the point stands: government-owned distributors are reflecting a substantial value of easements in the regulated asset

	MCE Comment	Author's response
	owned distributors' land and easements were obtained by right, without consideration. Compulsory acquisitions are subject to compensation arrangements under Part 4 of the *Acquisition of Land Act 1967* (Qld). See also comments re page 44	bases while the private distributors are not.
4	Page xii. Last paragraph – Revalue Assets. Asset value differences may be driven by asset mix, age and cost of construction so that simple averages mislead.	We agree values are affected by age and have said so in the report. Asset mix and cost of construction may also explain different valuations. But why should there be any reason for systematic differences in asset mix between government and private distributors? Cost of construction may also be significant, but if government owned distributors are constructing assets more expensively than private distributors then this information is relevant to comparisons of the valuation of assets owned by government and private distributors.
5	Page 19. Second paragraph states that in 2010, users were charged 30% more for distribution than for production. This statement is based on an average spot price of $40/MWh, which is too simplistic because it fails to recognise that production costs are also comprised of contract coverage costs and LRMC and the cost of energy to serve a customer is a mix of flat and peak contracts and pool. The statement is not borne out by the 2010-11 QCA BRCI report which shows (for distribution-connected customers) approx 42% energy cost, 38% distribution, 11% transmission and 9% retail.	The word "around" has been added to precede the word 30%. But we disagree with the substantive point that our calculation is "too simplistic". Actual contract prices may be different from average spot prices. Average contract prices are not known whereas average spot prices are, but there is no reason to believe that contracted prices will be systematically higher than spot prices. Indeed a comparison of average contract prices in the Sydney Futures Exchange and average spot prices bears this out. The cost to serve a particular customer mix is not relevant since only aggregate averages are used in the calculation for the calculation for the average customer. Finally the calculated LRMC of generation is irrelevant for the calculation of the relative proportion of the price that is distribution versus production. This is because the vast bulk of electricity produced through the NEM is established through market prices, rather than regulatory calculations of LRMC.

	MCE Comment	Author's response
6	Page 29. Fig 9 presents SAIFI figures averaged 2001 to 2009. As these are averages over low expenditure and high expenditure periods, they cannot be used to draw any conclusions about the impact or otherwise of expenditure over the period. Furthermore, they are aggregate figures over States – and as such relate to significantly different service area mixes. Fig 10 for SAIDI – same comments.	We disagree for the following reasons: Firstly, these averages are over a 10 year period during which there has been consistently rising expenditure by government owned distributors. We see no reason not to expect the impact of rising expenditure to be reflected in measurably significant improvements in the quality of supply over this period. Secondly, it is not clear what is meant by "significantly" different service area mixes. There is a comparable level of urbanisation in NSW, VIC, QLD and SA. The proportion of the customer mix in rural versus urban areas should be comparable when comparing the aggregate of Vic and SA, versus the aggregate of QLD and NSW. Furthermore, these "service area mixes" have not changed over the period of comparison. As such, the effect of expenditure on service quality (or to be more precise the absence thereof) is, we submit, valid information on which to make observations as we have.
6	Page 37. The second sentence makes an inappropriate comparison between expenditure per customer (Fig 8) and growth in absolute terms (Fig 14).	It is not clear why this comment has been made. The analysis is of growth-related capitalised expenditure per MW of additional demand, and separately of growth-related expenditure per connection.
7	Page 38. Commentary at end of section 4.1 does not consider the effect of changing standards on growth-related expenditure requirements.	As referenced in the End Notes, the data used in this calculation is based on AER analysis and distributors' regulatory applications that describes expenditure related to growth. The AER does not describe these data as being related to changing standards and so we have no reason to consider this in this analysis.
8	Page 39 Discussion about average remaining life and possible implications for replacement expenditure does not seem to take into account possible differences in asset age profiles underlying the average lives.	See response to comment 2.
9	Page 44. Section 4.5 – third paragraph seems to be	We disagree. The paragraph does not say that governments are able to value privately-owned distribution assets. The text explains the different incentives that governments might have depending

	MCE Comment	Author's response
	saying that governments are able to value both government-owned and privately-owned distribution assets. This is not correct.	on whether their distributors are privatized or not.
10	Page 44, Section 4.5, third paragraph [It is stated] that part of valuation differences may be explained by age – this is true. Another matter not mentioned however may be the nature of the assets themselves. In Qld (and NSW?) distributors own and operate a considerable amount of sub-transmission (110kV and 132kV) which has an inherently higher cost per kilometer (and incidentally, with reference to the next comment, frequently requires the taking of easements whereas lower voltage assets do not).	Distributors in South Australia also operate significant amounts of 132kV sub-transmission network, and in Victoria, 66kV network. While words have been added to the report to recognise differences in network composition, it is not obvious that these differences contribute much to the explanation of the difference between government and private distributors in terms of per-kilometer asset valuations.
11	Page 47. Second paragraph notes that Mountain and Littlechild found asset bases per customer lower in country NSW than metropolitan areas. The standards applicable to the different areas would need to be considered.	Any differences in planning or reliability standards are not relevant here. The comparison is of the costs and assets of metropolitan and country distributors as they are, irrespective of the level of service they provide. There is little doubt that if country networks provided the level of network redundancy and supply reliability of urban networks, that their costs would be much higher. But this is not relevant here.
12	Page 49. Reference is made to government-owned distributors' access to low-cost government debt. This is not correct – while Queensland government-owned corporations may borrow through the Queensland Treasury Corporation, they all pay a	We recognise that the Queensland Government's distributors do pay a "Competitive Neutrality Fee". We understand that the purpose of this fee – which is paid to the Queensland Treasury Corporation – is to increase the apparent cost of capital to the distributors. It is effectively a financial return to the Queensland Treasury Corporation on the funds that they borrow and in turn on-lend to the distributors in the form of unsecured perpetual loans. However the Queensland Government is the sole owner of its distributors and the Queensland Treasury Corporation and from this whole-of-government

	"competitive neutrality charge", based on their stand-alone credit rating and the market cost of debt. This is in line with the Queensland Government's commitments under the Competition Principles Agreement.	perspective, the Competitive Neutrality Fee is effectively an internal transfer payment that reduces the profitability of one of the corporations that the government owns and increases the profitability of its treasury by the same amount. The existence of this internal transfer payment does not extinguish the essential truth that government-owned distributors are funded through low cost government-sourced debt. Furthermore, it is not clear that in practice the Competitive Neutrality Fee has a significant impact on the cost of borrowing. For example in Energex's 2010 Financial Statements, note 2.2 shows a Competitive Neutrality Fee of $12m on unsecured loans with the Queensland Treasury Corporation worth $4094m. This is equivalent to a premium of just 0.29 percentage points. The comparable figure for Ergon in 2010 is 0.31 percentage points. This suggests that the Competitive Neutrality Fee is in practice largely inconsequential. This is supported by the observation in Note 10.2 of the Energex 2010 Financial Statement that the "weighted average interest rates on funds borrowed generally" is 5.78%. This is approximately equivalent to the swap rate. On this basis, we submit that both in respect of the whole-of-government logical evaluation and an empirical assessment, it is reasonable to conclude that Queensland government owned distributors enjoy access to low cost government debt.
13	Page 62. First paragraph – same comment as for Page 50.	Response to comment 12 refers.

End notes

[1] Based on a calculation of the difference between the index of electricity prices in 8 capital cities and the CPI All groups. Data from Australian Bureau of Statistics, 6401.0, Table 7 .
[2] *Average annual price of distribution was calculated by dividing the allowed revenues by the allowed electricity distribution forecasts by the AER.*
Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii; AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g, 2010. Table 41, p. LXI; IPART b, 2004. Table 7.2, p. 81; ESC b, 2005. Table A.1, p. 10; ESCoSA, 2005. Table 11.3, p. 169; ORG, 2000. Table II.1, p. 44; QCA, 2001. Table 9.3, p.141; QCA 2001. Table 9.4, p. 141; QCA, 2005. Table 8.8, p.178; QCA, 2005. Table 8.11, p.179.
Energy Distributed: AER 2008. Table 6.2, p. 84; AER 2008. Table 6.4, p. 89; AER 2008. Table 6.6, p. 93; AER a 2009. Table 5, p.xxiv; AER a 2009. Table 6, p.xxv; AER a 2009. Table 7, p.xxv; AER b 2010. Table 5, p. xviii; AER b 2010. Table 6, p. xviii; AER d, 2010. Table 6.17, p.67; AER g, 2010. Table 1, p. XVII; AER g, 2010. Table 2, p. XVII; AER g 2010. Table 3, p. XVIII; AER g, 2010. Table 4, p. XVIII; AER g, 2010. Table 5, p. XVIII; ESC b, 2005. Table 4.1, p. 132; IPART b 2004. Table A11.1, p. 243; IPART b 2004. Table A12.1, p. 251; IPART b 2004. Table A13.1, p. 259; IPART b 2004. Table A11.2, p. 243; IPART b 2004. Table A12.2, p. 251; IPART b 2004. Table A13.2, p. 259; MMA, 2004. Table 1, p. v; MMA, 2004. Table 5, p. viii; ORG, 2000. Table 3.1, p. 36.
[3] **Revenues:** ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii; AER b, 2010. Table 23, p. xl;
AER d, 2010. Table 16.6, p. 251; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g 2010. Table 41, p. LXI;
[4] Eslake and Walsh 2011, page 23.
[5] In this report, distribution refers to the provision of services for the carriage of electricity from very high voltage substations to the point of use by electricity consumers.
[6] See Mountain and Littlechild 2010.
[7] Electricity distributors in Tasmania, Western Australia, the Northern Territory and private networks in Western Australia and Mount Isa have not been included in this study because they were not regulated by the Australian Energy Regulator over the period of this study.
[8] The *rate* of demand growth has been comparable in Victoria and Queensland.
[9] Ofgem 2009a, page 17.
[10] Based on a calculation of the difference between the index of electricity prices in 8 capital cities and the CPI All groups. Data from Australian Bureau of Statistics, 6401.0, Table 7 .
[11] *Average annual price of distribution was calculated by dividing the allowed revenues by the allowed electricity distribution forecasts by the AER.*
Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii; AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g, 2010. Table 41, p. LXI; IPART b, 2004. Table 7.2, p. 81; ESC b, 2005. Table A.1, p. 10; ESCoSA, 2005. Table 11.3, p. 169; ORG, 2000. Table II.1, p. 44; QCA, 2001. Table 9.3, p.141; QCA 2001. Table 9.4, p. 141; QCA, 2005. Table 8.8, p.178; QCA, 2005. Table 8.11, p.179.
Energy Distributed: AER 2008. Table 6.2, p. 84; AER 2008. Table 6.4, p. 89; AER 2008. Table 6.6, p. 93; AER a 2009. Table 5, p.xxiv; AER a 2009. Table 6, p.xxv; AER a 2009. Table 7, p.xxv; AER b 2010. Table 5, p. xviii; AER b 2010. Table 6, p. xviii; AER d, 2010. Table 6.17, p.67; AER g, 2010. Table 1, p. XVII; AER g, 2010. Table 2, p. XVII; AER g 2010. Table 3, p. XVIII; AER g, 2010. Table 4, p. XVIII; AER g, 2010. Table 5, p. XVIII; ESC b, 2005. Table 4.1, p. 132; IPART b 2004. Table A11.1, p. 243; IPART b 2004. Table A12.1, p. 251; IPART b 2004. Table A13.1, p. 259; IPART b 2004. Table A11.2, p. 243; IPART b 2004. Table A12.2, p. 251; IPART b 2004. Table A13.2, p. 259; MMA, 2004. Table 1, p. v; MMA, 2004. Table 5, p. viii; ORG, 2000. Table 3.1, p. 36.

[12] **Revenues:** ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii; AER b, 2010. Table 23, p. xl;
AER d, 2010. Table 16.6, p. 251; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g 2010. Table 41, p. LXI;
[13] Eslake and Walsk 2011, page 23.
[14] In this report, distribution refers to the provision of services for the carriage of electricity from very high voltage substations to the point of use by electricity consumers.
[15] ENA Statement, Energy Prices, July 2009.
[16] Australian Industry Group, February 2011. "*Energy Shock, Confronting Higher Prices*", Page 21
[17] RBA, Bulletin December Quarter 2010, "Developments in Utility Prices". Available from http://www.rba.gov.au/publications/bulletin/2010/dec/2.html
[18] Prime Minister Julia Gillard, Speech to the Australian Industry Group, 26 October 2010, http://www.pm.gov.au/press-office/speech-australian-industry-group
[19] AER f, 2010. Page 4 and Australian Energy Markets Commission, 2011. Page 5.
[20] Australian Financial Review, 11 May 2011."*States blamed for power price surge*"
[21] Australian Treasury 2009. Page 52.
[22] Prime Minister Julia Gillard, Speech to the Australian Industry Group, 26 October 2010, http://www.pm.gov.au/press-office/speech-australian-industry-group
[23] Garnaut, 2011. Page 42.
[24] The Australian Newspaper, 31 March 2011. "*Ross Garnaut's carbon pricing plan naïve say producers" http://www.theaustralian.com.au/national-affairs/ross-garnauts-carbon-pricing-plan-naive-say-energy-producers/story-fn59niix-1226031035687*
[25] Ipart 2011, page 82 to 85.
[26] Electricity distributors in Tasmania, Western Australia, the Northern Territory and private networks in Western Australia and Mount Isa have not been included in this study because they were not regulated by the Australian Energy Regulator over the period of this study.
[27] **Regulatory Asset Bases:** ACT, 2009. Table 11, p. 6; ACT, 2009. Table 13, p. 7; ACT, 2009. Table 14, p. 8; AER b, 2010. Table 16.6, p. 320; AER b, 2010. Table 16.8, p. 323;
AER d 2010. Table 16.4, p. 248; AER g, 2010, 2010. Table 18.12, p. 819; AER g 2010. Table 18.14, p. 821; AER g 2010. Table 18.16, p. 822; AER g 2010. Table 18.18, p. 824; AER g 2010. Table 18.20, p. 826.
[28] **Network length** AER f, 2010. Table 2.2, p. 50
[29] **Energy Distributed:** AER a, 2009. Table 5, p.xxiv; AER a, 2009. Table 6, p.xxv; AER a, 2009. Table 7, p.xxv; AER b, 2010. Table 5, p.xviii; AER b, 2010. Table 6, p. xviii; AER b, 2010. Table 4, p.xix; AER g, 2010. Table 1, p. xvii; AER g, 2010. Table 2, p. xviii; AER g, 2010. Table 3, p. xviii; AER g, 2010. Table 4, p. xviii; AER g, 2010. Table 5, p. xviii.
[30] **Customer Numbers:** AER a, 2009. Table 5, p. xxiv; AER a, 2009. Table 6, p. xxv; AER a, 2009. Table 7, p. xxv; AER b, 2010. Table 5, p. xviii; AER b, 2010. Table 6, p. xviii; AER d, 2010. Table 4, p. xix; AER g, 2010. Table 1, p. xvii; AER g, 2010. Table 2, p. xvii;
AER g, 2010. Table 3, p. xviii; AER g, 2010. Table 4, p. xviii; AER g, 2010. Table 5, p. xviii.
[31] **Revenues:** ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii; AER b, 2010. Table 23, p. xl; AER d, 2010. Table 16.6, p. 251; AER g 2010. Table 37, p. LIX; AER g 2010. Table 38, p. LX; AER g 2010. Table 39, p. LX; AER g 2010. Table 40, p. LXI; AER g 2010. Table 41, p. LXI.
[32] **Capex:** AER a, 2009. Table 8, p. xxvii; AER a, 2009. Table 9, p. xxix; AER a, 2009. Table 11, p. xxx; AER b, 2010. Table 11, p. xxii; AER b, 2010. Table 12, p. xxiii; AER b, 2010. Table 6, p. xxi; AER g, 2010. Table 8.38, p. 441; AER g 2010. Table 8.39, p. 442; AER g, 2010. Table 8.40, p. 442; AER g, 2010. Table 8.41, p. 443; AER g, 2010. Table 8.42, p. 443.
Opex: ACT, 2009. Table 7, p.5; ACT, 2009. Table 19, p.9; ACT, 2009. Table 26, p. 12;
AER b, 2010. Table 13, p. xxv; AER b, 2010. Table 14, p. xxvi; AER d, 2010. Table 8.1, p. 180; AER g, 2010. Table 7.31, p. 376; AER g 2010. Table 7.32, p. 377; AER g 2010. Table 7.33, p. 378; AER g 2010. Table 7.34, p. 379; AER g 2010. Table 7.35, p. 380; ESC b 2005. Table 6.2, p. 196; Meritec 2003. Table 20, p. 74; Meritec 2003. Table 17, p. 57; Meritec 2003 Table 23, p. 91; ORG, 2000. Table 6, p. xx;

[33] **Capex:** AER a, 2009. Table 8, p. xxvii; AER a, 2009. Table 9, p. xxix; AER a, 2009. Table 11, p. xxx; AER b, 2010. Table 11, p. xxii; AER b, 2010. Table 12, p. xxiii; AER d, 2010. Table 6, p. xxi; AER g, 2010. Table 8.38, p. 441; AER g, 2010. Table 8.39, p. 442; AER g, 2010. Table 8.40, p. 442; AER g, 2010. Table 8.41, p. 443; AER g, 2010. Table 8.42, p. 443.
[34] Based on an average price in the spot market for electricity of $40/MWh.
[35] This is based on data available from the distributors' annual reports and corroborated with reports from the NSW Auditor General available from www.audit.nsw.gov.au
[36] See Integral Energy, 2010. "*Integral Energy 2009/10 Statement of Corporate Intent*", page 7.
[37] This is based on data available from the distributors' annual reports.
[38] AER 2010, "Victorian Electricity Distribution Businesses, comparative performance report for calendar year 2009.
[39] Prices charged to some customers – mostly domestic customers – are capped in some states.
[40] Ergon Energy and Energex, Queensland's distributors are subject to revenue caps.
[41] ABS data (see Grattan 2011) shows the multi-factor productivity gain in utilities in the 1990s was just a little under the average productivity gain in Australia.
[42] National Competition Policy Review, Australian Government Printer, August 1993.
[43] Australian Energy Regulator, 2005. "New Energy Market Regulatory Framework", presentation by Steve Edwell, Chairman. Investor Client Luncheon, Macquarie Bank. Available from http://www.aer.gov.au/content/index.phtml/itemId/689405/fromItemId/656052
[44] Since the regulatory regime caps prices (other than for Ergon in Queensland where revenues are capped), the actual revenue can be different to the revenue that the regulators had determined would arise based on the capped prices they allowed. In Victoria, the annual average difference between actual and allowed revenues between and 2002 and 2009 was $73m or 5.8% of allowed revenues. Data on actual revenues compared to allowed revenues in other states is not available. However we do not expect that differences between actual and allowed revenues would meaningfully affect the results shown in Figure 2.
[45] Starting in July 2009 in Victoria, July 2010 in Queensland and South Australia and January 2011 in Victoria)
[46] *Allowed revenue by customer was calculated by dividing the AER's allowed revenues by the AER's allowed customers.*
Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii;
AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g, 2010. Table 41, p. LXI; IPART b, 2004. Table 7.2, p. 81;
ESCoSA 2005. Table 11.3, p. 169; ORG, 2000. Table II.1, p. 44; QCA 2001. Table 9.3, p.141; QCA 2001. Table 9.4, p. 141; QCA 2005. Table 8.8, p.178; QCA 2005. Table 8.11, p.179.
Customer Numbers: AER a, 2009. Table 5, p. xxiv; AER a, 2009. Table 6, p. xxv; AER a, 2009. Table 7, p. xxv; AER b, 2010. Table 5, p. xviii; AER b, 2010. Table 6, p. xviii; AER d, 2010. Table 4, p. xix; AER g, 2010. Table 1, p. xvii; AER g, 2010. Table 2, p. xvii; AER g 2010. Table 3, p. xviii; AER g, 2010. Table 4, p. xviii; AER g, 2010. Table 5, p. xviii; ESC 2003, p. 23; ESC 2004, p. 75; ESC a, 2005, p. 68; ESC 2006, p. 77; ESC 2007, p. 79;
ESCoSA, 2005. Table 5.3, p. 66; MMA, 2004. Exec Table 1, p. v; MMA, 2004. Exec Table 5, p. viii.
[47] *Allowed Revenue by Customer for Government and private DNSP's was calculated by dividing the allowed revenues by the customer numbers per distributor.*
Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii;
AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g, 2010. Table 41, p. LXI; IPART b, 2004. Table 7.2, p. 81; ESC b, 2005. Table A.1, p. 10; ESCoSA 2005. Table 11.3, p. 169; ORG, 2000. Table II.1, p. 44; QCA 2001. Table 9.3, p.141; QCA 2001. Table 9.4, p. 141; QCA 2005. Table 8.8, p.178; QCA 2005. Table 8.11, p.179.
Customer Numbers: AER a, 2009. Table 5, p. xxiv; AER a, 2009. Table 6, p. xxv;

AER a, 2009. Table 7, p. xxv; AER a 2010. Table 6.2, p. 55; AER b, 2010. Table 5, p. xviii; AER b, 2010. Table 6, p. xviii; AER d, 2010. Table 4, p. xix; AER g, 2010. Table 1, p. xvii; AER g, 2010.

Table 2, p. xvii; AER g, 2010. Table 3, p. xviii; AER g, 2010. Table 4, p. xviii; AER g, 2010. Table 5, p. xviii; ESC 2003. p. 23; ESC 2004. p. 75; ESC a, 2005. p. 68; ESC 2006. p. 77; ESC 2007. p. 79; ESCoSA o, 2005. Table 5.3, p. 66; IPART b 2004. Table A11.1, p. 243; IPART b, 2004. Table A11.2, p. 243; IPART b, 2004. Table 12.1, p. 251; IPART b, 2004. Table 12.2, p.251;
IPART b, 2004, Table A13.1, p. 259; IPART b. Table 13.2, p. 259; MMA, 2004. Exec Table 1, p. v; MMA, 2004. Exec Table 5, p. viii.

[48] *Revenue per customer for the metropolitan DNSP's was calculated by dividing the allowed revenues by the allowed customer numbers per relevant distributor.*

Revenues: ACT 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii
AER g2010. Table 3, p. ix; ESC b 2005. Table A.1, p.10; IPART 1999. Table A8.6, p. 247;
IPART 1999. Table A 7.6, p. 239; IPART b 2004. Table A11.5, p. 246; IPART b 2004. Table A 12.5, p. 254; ORG, 2000. Table 6, p.xx; QCA 2001. Table 9.3, p. 141; QCA 2005. Table 8.8, p. 178.
Customer Numbers: AER a, 2009. Table 6, p. xxv; AER a, 2009. Table 7, p. xxv; AER a 2010. Table 6.2, p. 55; AER b, 2010. Table 3, p. xvi; AER g, 2010. Table 1, p. xvii; AER g, 2010. Table 3, p. xviii; AER g, 2010. Table 5, p. xviii; ESC 2003. p. 23; ESC 2004. p. 75; ESC a 2005. p. 68; ESC 2006. p. 77; ESC 2007. p. 79; IPART b 2004. Table A12.1, p. 251; IPART b 2004. Table A12.2, p. 251; IPART b 2004. Table A11.1, p. 243; IPART b 2004. Table 11.2, p. 243; MMA 2004. Exec Table 2, p. iv.

[49] *Revenue per customer for the country DNSP's was calculated by dividing the allowed revenues by the allowed customer numbers per relevant distributor.*

Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 40, p. LXI; ESC n, 2005. Table A.1, p. 10; ESCoSA o, 2005. Table 11.3, p. 169; IPART, 1999. Table 11.9, p. 246; IPART, 1999. Table 12.9, p. 254; IPART, 1999. Table 13.9, p. 262; IPART, 2004. Table A13.9, p. 262; ORG, 2000. Table 6, p. xx; QCA, 2001. Table 9.4, p. 141; QCA, 2005. Table 8.11, p. 179

Customer Numbers: AER a 2009. Table 5, p. xxiv; AER a 2010. Table 6.2, p. 55; AER d, 2010. Table 6, p. xviii; AER d 2010. Table 4, p. xix; AER g 2010. Table 2, p. xvii; AER g 2010. Table 4, p. xviii;
ESC 2003. p. 23; ESC 2004. p. 75; ESC a, 2005. p. 68; ESC 2006. p. 77; ESC 2007. p. 79;
ESCoSA o, 2005. Table 5.3, p. 66; IPART b 2004. Table A11.1, p. 243; IPART b 2004. Table A11.2, p. 243; IPART b 2004. Table 12.1, p. 251; IPART b 2004. Table 12.2, p.251;
IPART b 2004, Table A13.1, p. 259; IPART b 2004. Table 13.2, p. 259; MMA 2004. Exec Table 6, p. vii.

[50] *The allowed opex per customer was calculated by dividing the allowed opex by the customer numbers by the relevant DNSP.*

Opex: ACT, 2009. Table 7, p.5; ACT, 2009. Table 19, p.9; ACT, 2009. Table 26, p. 12;
AER b, 2010. Table 13, p. xxv; AER b, 2010. Table 14, p. xxvi; AER d, 2010. Table 8.1, p. 180; AER g, 2010. Table 7.31, p. 376; AER g 2010. Table 7.32, p. 377; AER g 2010. Table 7.33, p. 378; AER g 2010. Table 7.34, p. 379; AER g 2010. Table 7.35, p. 380; ESC b 2005. Table 6.2, p. 196; Meritec 2003. Table 20, p. 74; Meritec 2003. Table 17, p. 57; Meritec 2003 Table 23, p. 91; ORG, 2000. Table 6, p. xx;
Customer numbers: AER a 2009. Table 5, p. xxiv; AER a 2009. Table 6, p. xxv;

AER a 2009. Table 7, p. xxv; AER b 2010. Table 5, p. xviii; AER a 2010. Table 6.2, p. 55; AER b 2010. Table 6, p. xviii; AER d 2010. Table 4, p. xix; AER g 2010. Table 1, p. xvii; AER g 2010. Table 2, p. xvii; AER g 2010. Table 3, p. xviii; AER g 2010. Table 4, p. xviii; AER g 2010. Table 5, p. xviii; ESC 2003. p. 23; ESC 2004. p. 75; ESC a 2005. p. 68; ESC 2006. p. 77; ESC 2007. p. 79; ESCoSA o, 2005. Table 5.3, p. 66; IPART b 2004. Table A11.1, p. 243; IPART b 2004. Table A11.2, p. 243; IPART b 2004. Table 12.1, p. 251; IPART b 2004. Table 12.2, p.251; IPART b 2004, Table A13.1, p. 259; IPART b 2004. Table 13.2, p. 259; MMA, 2004. Exec Table 1, p. v; MMA, 2004. Exec Table 5, p. viii; ORG, 2000. Table 3.1, p.36.

[51] *The RAB per customer was calculated by dividing the allowed RAB forecast RAB roll-forward by the customer number forecasts.*

RAB: ACT 2009. Table 11, p. 6; ACT 2009. Table 13, p. 7; ACT 2009. Table 14, p. 8

AER b 2010. Table 16.6, p. 320; AER b 2010. Table 16.8, p. 323; AER a 2010. Table 6.2, p. 55; AER d 2010. Table 16.4, p. 248; AER g 2010, 2010. Table 18.12, p. 819; AER g 2010. Table 18.14, p. 821; AER g 2010. Table 18.16, p. 822; AER g 2010. Table 18.18, p. 824; AER g 2010. Table 18.20, p. 826.
Customer Numbers: AER a, 2009. Table 5, p. xxiv; AER a, 2009. Table 6, p. xxv;
AER a, 2009. Table 7, p. xxv; AER b, 2010. Table 5, p. xviii; AER b, 2010. Table 6, p. xviii
AER d, 2010. Table 4, p. xix; AER g 2010. Table 1, p. xvii; AER g 2010. Table 2, p. xvii
AER g 2010. Table 3, p. xviii; AER g 2010. Table 4, p. xviii; AER g 2010. Table 5, p. xviii.

[52] **Capex:** AER 2008. Table 5.8, p. 82; AER 2008. Table 5.6, p. 80;
AER 2008. Table 5.5, p. 79;AER a, 2009. Table 8, p. xxvii; AER a, 2009. Table 9, p. xxix; AER a, 2009. Table 11, p. xxx; AER a, 2010. Table 7.1, p. 85; AER b, 2010. Table 11, p. xxii; AER b, 2010. Table 12, p. xxiii; AER c 2010. Table 7.1, p. 102;AER d, 2010. Table 6, p. xxi; AER g, 2010. Table 8.38, p. 441; AER g, 2010. Table 8.39, p. 442; AER g 2010. Table 8.40, p. 442; AER g, 2010. Table 8.41, p. 443; AER g, 2010. Table 8.42, p. 443; IPART b 2004. Table 4.4, p. 29; ESoSA 2005. Table 7.1, p. 77; QCA 2004. Figure 4.2, p. 68; QCA 2004 Figure 4.3, p. 73.
Customer numbers: AER a 2009. Table 5, p. xxiv; AER a 2009. Table 6, p. xxv; AER a 2009. Table 7, p. xxv; AER b 2010. Table 5, p. xviii; AER a 2010. Table 6.2, p. 55; AER b 2010. Table 6, p. xviii; AER d 2010. Table 4, p. xix; AER g 2010. Table 1, p. xvii; AER g 2010. Table 2, p. xvii; AER g 2010. Table 3, p. xviii; AER g 2010. Table 4, p. xviii; AER g 2010. Table 5, p. xviii; ESC 2003. p. 23; ESC 2004. p. 75; ESC a, 2005. p. 68; ESC 2006. p. 77; ESC 2007. p. 79;
ESCoSA, 2005. Table 5.3, p. 66; MMA 2004. Exec Table 1, p. v; MMA 2004. Exec Table 5, p. viii.

[53] **SAIFI:** AER b, 2009. Table 6.5, p. 175.

[54] **SAIDI:** AER b, 2009. Table 6.4, p. 175.

[55] *The revenue per customer was calculated by dividing the allowed and RAB roll-forward by the allowed customer numbers.*
Revenues: ACT, 2009. Table 29, p. 13; AER b, 2010. Table 21, p. xxxviii;
AER b, 2010. Table 23, p. xl; AER d, 2010. Table 12, p. xxxiii; AER g, 2010. Table 37, p. LIX; AER g, 2010. Table 38, p. LX; AER g, 2010. Table 39, p. LX; AER g, 2010. Table 40, p. LXI; AER g, 2010. Table 41, p. LXI; IPART b, 2004. Table 7.2, p. 81; ESCoSA 2005. Table 11.3, p. 169; ORG, 2000. Table II.1, p. 44; QCA w, 2001. Table 9.3, p.141; QCA 2001. Table 9.4, p. 141; QCA 2005. Table 8.8, p.178; QCA 2005. Table 8.11, p.179.
Customer Numbers: AER a, 2009. Table 5, p. xxiv; AER a, 2009. Table 6, p. xxv;

AER a, 2009. Table 7, p. xxv; AER a 2010. Table 6.2, p. 55; AER b, 2010. Table 5, p. xviii; AER b, 2010. Table 6, p. xviii; AER d, 2010. Table 4, p. xix; AER g, 2010. Table 1, p. xvii; AER g, 2010. Table 2, p. xvii; AER g, 2010. Table 3, p. xviii; AER g, 2010. Table 4, p. xviii; AER g, 2010. Table 5, p. xviii; ESC 2003, p. 23; ESC 2004, p. 75; ESC a, 2005, p. 68; ESC 2006, p. 77; ESC 2007, p. 79; ESCoSA, 2005. Table 5.3, p. 66; MMA, 2004. Exec Table 1, p. v; MMA, 2004. Exec Table 5, p. viii.; Vass and Marchant, 2002. Page 13; Ofgem 1999. Annex 2; Ofgem 2004, pages 125 to 138. All British data was converted into 2010 GBP using CPI All Groups, and then into Australian Dollars at 1.59 AUD per GBP based on the value at 3 February 2011.

[56] Calculations based on data in AER, 2008. Table 6.4, p.89; AER, 2008. Table6.2, p.86;
AER b, 2009. Table 6.1, p.156; AER a 2010. Table 6.4, p.59; Energex Annual Report 2009/10, p.56; ETSA Utilities Annual Report 2009, p.13; ETSA Utilities Annual Report 2007, p. 8; ETSA Utilities Annual Report 2008, p. 15; IPART b, 2004, Table A14.2, p. 279;
IPART b, 2004, Table A14.3, p. 279; QCA, 2005, Figure 1.1, p.5.

[57] Historic trend rates are used rather than regulatory estimates in order to ensure analytical objectivity and consistency.

[58] Customer density of urban distributors in government and privately owned networks is comparable while customer density of government-owned distributors may be slightly lower. However this is unlikely to explain differences since density of poor predictor of efficient cost as explained later in the paper.

[59] The average remaining asset life is a weighted average calculation based on the asset mix contained in the Post Tax Revenue Model and so takes account of the age profile of the total portfolio of assets. A comparison of the remaining life calculated on this basis is, we suggest,

appropriate unless there is a significant asymmetry in the asset age profile of the assets of government and private distributors. In other words, a conclusion based on the weighted average remaining life of government and private distributors would be invalid if government owned distributors have a large preponderance of fully depreciated assets (and hence are given a low weight in the calculation of remaining life) that need to be replaced, while the privately owned distributors do not.

[60] Prime Minister Julia Gillard, Speech to the Australian Industry Group, 26 October 2010, http://www.pm.gov.au/press-office/speech-australian-industry-group

[61] Pierce, J., Price, D., Rose, D., "The performance of the NSW Electricity Supply Industry", Reserve Bank of Australia, 1995.

[62] Independent Panel, 2004. Page 8

[63] Independent Panel, 2004. Page 11

[64] Independent Panel, 2004. Page 15

[65] Independent Panel, 2004. Page 8.

[66] See Pollitt 2009

[67] Independent Panel, 2004. Pages 8 to 10

[68] This is based on the asset valuation for land and easements that is held in the Post Tax Revenues Models that the Australian energy regulator uses to calculate maximum allowed prices and revenues. These are publicly available from the AER's website for Victorian distributors, and the AER provided us with the relevant information from these models for the other distributors.

[69] Based on a 10% cost of capital and asset value of $693m

[70] For asset values see Ofgem, 2009. Pages 52 to 63. For network length see Vass and Marchant, 2002. Page 13.

[71] Based on data in Vass and Marchant 2002, page 13.

[72] ESAA, 2009. Electricity Gas Australia. Table 3.1 Page 24.

[73] Independent Panel, 2004. page 6.

[74] Mountain, B.R, 2010. "*Analysis of the Australian Energy Regulator's assessment of the Debt Risk Premium in its Draft Decision on price controls for the period 2010/11 to 2015/16 for the Victorian electricity distributors, A report to the Energy Users Association of Australia*", page 8. Available from www.aer.gov.au

[75] AER 2010. "Victorian electricity distribution network service providers, distribution determination 2011-2015." Page 498.

[76] In Britain, the regulator, Ofgem, calculated a benchmark cost of based on the actual cost of of the distributors. In Australia, the AER rejected this on the basis that such benchmarking was "inconsistent with the principles of incentive regulation". Instead the AER used a benchmark based on costs for Australian corporate borrowers, none of whom distribute electricity. The AER itself noted that the distributors actual cost of was below the level that it determined.

[77] Based on the RAB data in ACT 2009. Table 11, p. 6; ACT 2009. Table 13, p. 7; ACT 2009. Table 14, p. 8; AER b 2010. Table 16.6, p. 320; AER b 2010. Table 16.8, p. 323; AER d 2010. Table 16.4, p. 248; AER g 2010, 2010. Table 18.12, p. 819; AER g 2010. Table 18.14, p. 821; AER g 2010. Table 18.16, p. 822; AER g 2010. Table 18.18, p. 824; AER g 2010. Table 18.20, p. 826.

[78] Australian Financial Review, 22 February 2010. Letter from Andrew Blythe, CEO, Energy Networks Association.

[79] For the Australian analysis, revenue per customer was correlated with customer density and network density in 2001 and 2010. The results were correlations of 36% and -23% in 2001 and 2010 respectively for customer density and 51% and 75% in 2001 and 2010 respectively for network density. For the British analysis the correlation of customer density was 10% and for network density it was -19% in 2001. Data sources for revenue, customer numbers and areas of supply in Australia are set out in distributor annual reports and endnote xlvi and xliii. Data sources for revenues, customer numbers and areas of supply in Great Britain are Ofgem 1999, Annex 2;Ofgem 2004, page 125 to 138; Ofgem 2009, pages 57 to 63, and CRI 2001, page 13.

[80] For example Independent Panel (2004, page 25) suggested that the approximate cost of a single wire earth return line is around $9,000 per kilometre, compared with $15,000 per kilometre for a two wire line of similar capacity and $33,000 per kilometre for a three phase network.

[81] **Regulatory Asset Bases:** ACT, 2009. Table 11, p. 6; ACT, 2009. Table 13, p. 7; ACT, 2009. Table 14, p. 8; AER b, 2010. Table 16.6, p. 320; AER b, 2010. Table 16.8, p. 323;
AER d 2010. Table 16.4, p. 248; AER g, 2010, 2010. Table 18.12, p. 819; AER g 2010. Table 18.14, p. 821; AER g 2010. Table 18.16, p. 822; AER g 2010. Table 18.18, p. 824; AER g 2010. Table 18.20, p. 826.

[82] Based on AER decisions, the operating cost per customer served by country distributors in 2014 will be $352 per customer, while for metropolitan distributors it will be $248 per customer. Sources (ACT, 2009. Table 7, p.5; ACT, 2009. Table 19, p.9; ACT, 2009. Table 26, p. 12; AER b, 2010. Table 13, p. xxv; AER b, 2010. Table 14, p. xxvi; AER d, 2010. Table 8.1, p. 180; AER g, 2010. Table 7.31, p. 376; AER g 2010. Table 7.32, p. 377; AER g 2010. Table 7.33, p. 378; AER g 2010. Table 7.34, p. 379; AER g 2010. Table 7.35, p. 380)

[83] It might be argued that state governments require high rates of return from their distributors because politicians prefer to "cut the ribbon" on new schools, rather than on new distribution substations. In other words if the businesses were not highly profitable, the government would not invest in them but would rather spend its money on other public services. There are various counter-arguments: employees are politically significant too and the Electrical Trade Union leaders have played prominent roles in the governments of both NSW and QLD. And, the political fall-out from power failures would ensure a minimum level of spending needed to ensure reliable supply, regardless of the profitability of this spending. Both of these suggest that governments are more likely to attach a low opportunity cost to the funds they allocate to their distributors. However, this may be beside the point anyway: the high profitability of electricity distribution has allowed distributors to fund their substantial investments through profits and retained funds[83]. There has been sufficient capacity on the balance sheets of the distributors to fund any temporary differences between revenues and cash flows, through higher gearing. In other words, it appears that the governments of New South Wales and Queensland have not had to decide between spending on substations and schools – spending on the substations has taken care of itself.

[84] New South Wales Treasury, 2010. "*Budget statement 2010-11*". Table 5.9, page 5-17.

[85] Daily Telegraph, 5 October 2010. "Charges fill the coffers – Power Struggle"

[86] AER a, 2009. Table 8, p. xxvii

[87] Ofgem, 2009. Pages 52 to 63

[88] AEMC, 2006. "*Draft Rule Determination, Draft National Electricity Amendment Rule 2006, July 2006*", page .

[89] Australian Competition Tribunal, 2009. "ACompT 8", paragraph 190.

[90] In its submission to the AEMC's proposed Rules, the AER referred to statements made by the AEMC in relation to the objects of the provisions on the propose-respond model. These included that:

- responsibility for deciding whether forecasts are reasonable estimates rests with the AER;
- the decision making process and criteria are intended to provide the AER with sufficient powers and safeguards to be able to achieve regulatory outcomes that are not overly distorted by strategic behaviour on the part of TNSPs;
- the AER should be able to deal with exaggerated proposals and TNSPs are likely to see the benefits of well supported forecasts, as opposed to ambit claims and poorly supported forecasts;
- the criteria specified in the Draft Rules are relevant and appropriate and the weight to be given to each criterion is to be determined by the AER depending on the relevance of each factor in each particular case.

The AER then noted that "*it is essential that the regulator has the ability to properly scrutinise and assess these forecasts. Further review by the AEMC may be required if the final Rules are interpreted so as to fail to achieve the objectives noted above.*" (Source: AER, 15 September 2006, Letter to AEMC on Draft National Electricity Amendment Rule 2006.)

[91] AER, May 2010. Queensland distribution determination 2010-11 to 2014-15, Final Decision. Page 165.
[92] Pollitt, M.G., Haney, A. B, 2009.
[93] AER, November 2009. "Queensland Draft Distribution determination", page 159.
[94] *Ibid*
[95] Ofgem 2009a, page 17.
[96] For example, see The Australian, 28 October 2010 "Power blame game heats up" in which the NSW Energy Minister responded to criticism from the Federal Treasurer for rising electricity prices by pointing out that the Australian Energy Regulator sets regulated tariffs.