



AER submission to the Productivity Commission Inquiry into Electricity Network Regulation

April 2012

1 Summary

The Australian Energy Regulator (AER) welcomes the opportunity to provide this submission to the Productivity Commission's Electricity Network Regulation inquiry. The AER understands that this inquiry will assess:

- the use of benchmarking as a means of achieving the efficient delivery of network services and electricity infrastructure to meet the long-term interests of consumers and
- whether the regulatory regime as applied to interconnectors, is delivering efficient levels of network and generation investment in the National Electricity Market (NEM).

As the economic regulator for electricity distribution and transmission network businesses in the NEM, the AER is responsible for regulating network business' expenditures to ensure these are consistent with the national electricity objective of promoting efficient investment in, and use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality, reliability, safety and supply. Given these responsibilities, the AER has a unique perspective on the issues being considered by the Productivity Commission.

At this stage of the inquiry, the AER's submission focuses on outlining the network planning and investment outcomes and the work the AER is undertaking in benchmarking. As highlighted by the Productivity Commission in its issues paper, the AER notes that there are a number of ongoing related reviews and policy processes underway, looking at aspects of the regulatory framework this inquiry seeks to address. In particular, the Australian Energy Market Commission's (AEMC) Transmission Frameworks Review should provide an additional opportunity to identify reforms needed to address shortcomings in the current framework for transmission interconnection.

Benchmarking is an important regulatory analytical tool that is utilised by regulators to examine the historic costs of the firm or the industry, and endeavours to look forward, to estimate the efficient costs of delivering services. The AER is developing greater capabilities in benchmarking through the collection, analysis and reporting of consistent data to allow for comparisons of network businesses'

expenditures and service outcomes. This work will enhance the AER's ability to assess the efficiency of the regulated network businesses' expenditure proposals during a revenue determination.

2 Overview of incentive based regulation

In discussing the use of benchmarking, it is important to provide some contextual background about the underlying economic regulatory regime under which benchmarking is applied by the AER to the electricity network businesses it regulates. This section provides a brief overview of incentive based regulatory regime. The effectiveness of incentive based regulation and the AER's work in benchmarking are discussed further in sections 3 and 4 of this submission.

Infrastructure assets in Australia have traditionally been owned by governments, and the prices for infrastructure services was largely determined or approved by government ministers. Over the last decade and a half, Australia has undergone significant infrastructure reform. In the energy sector in particular, national competition reform has seen the separation of vertically integrated monopolies into the various components of generation/wholesale, transmission, distribution and retail segments. In some jurisdictions all these segments have been privatised, while in other jurisdictions privatisation has been more limited. Associated with this has been the establishment of independent economic regulation of the non-contestable electricity transport segments - transmission and distribution, to mitigate the concern with monopoly pricing. More recently, the energy market reforms have also included the establishment of the AER to regulate all electricity networks in the NEM, as well as the AEMC as rule maker, and the introduction of a revised regulatory framework to regulate monopoly transmission and distribution network businesses.

The economic regulatory framework for network businesses is essentially based on the concept of 'incentive regulation' which seeks to provide strong incentives for regulated businesses to reduce costs, improve service quality, and undertake efficient investment. The incentive to reduce costs is provided by the regulator setting the prices or revenue to apply at the start of the regulatory period, regardless of what actual costs are incurred during the regulatory period. Regulated businesses that realise efficiency gains can retain these benefits for a time, and the benefits are later shared with customers in the form of lower prices. Other incentives to maintain or improve service quality levels work in combination with efficiency incentives to ensure that improved efficiency is not at the expense

of service quality. Overall, the regulatory framework seeks to provide appropriate signals for regulated businesses to make efficient investments and not over or under invest in the network.

The 'revealed cost' approach is a key feature of the regulatory framework, when incentives are effective in promoting efficient outcomes. In such cases, the business's actual costs, as revealed through regulatory accounts, are taken to be the 'efficient' costs and become the starting point for assessing the needs of the business to provide services in the forthcoming regulatory period. In this way, efficiency gains that the businesses have made are passed back to consumers in the form of lower prices. Although this is a key starting point for the AER's assessment of the expenditure forecasts in revenue determinations, the AER makes adjustments to the regulated allowances to take account of changing circumstances that are likely to apply in the forthcoming period. These include the extent of asset replacement required to deal with an ageing asset base, the need for new assets to meet continuing growth in demand and customers numbers, changes in financing costs, input costs and meeting reliability, safety and other service obligations.

It should be noted, however, that, where businesses have not adequately responded to the incentives provided or where the network business' proposal points to changes in forecasts which are not otherwise justified, the AER cannot solely rely on revealed costs and would still need to use other comparative benchmarking approaches. It is against this background that the AER is looking to significantly enhance its current benchmarking and assessment capabilities.

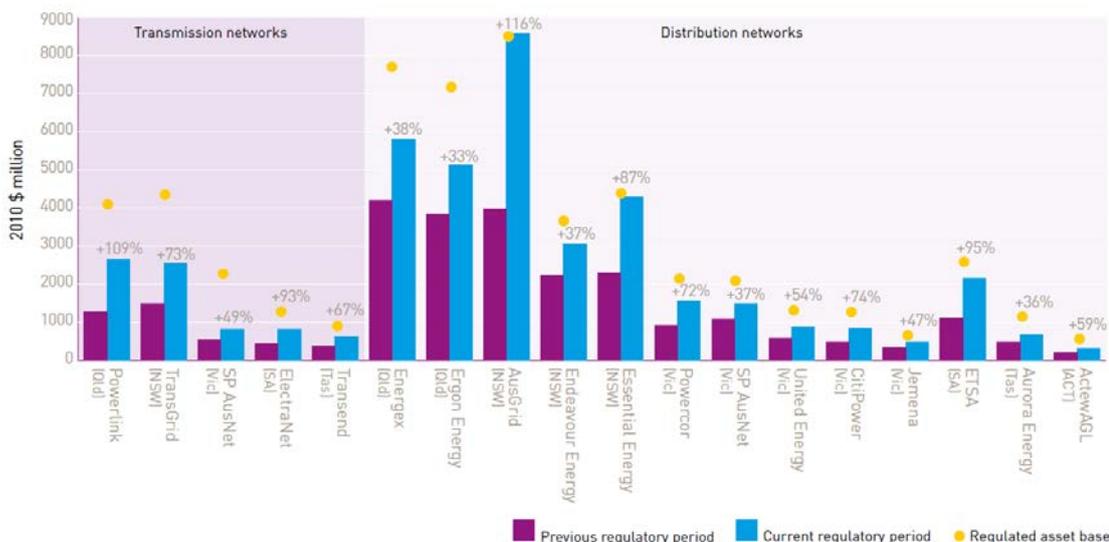
Section 3 provides a brief discussion of the economic regulatory regime in promoting efficient investment, with a focus on the Victorian businesses, which are seen to be responding more readily to the incentive framework that underpins the regime. Section 4 further explores the regime in terms of some of the benchmarking approaches that have been undertaken by the AER to date and also outlines the AER's plans to enhance its benchmarking capabilities.

3 Effectiveness of incentive based regulation

Electricity investment levels in the NEM

The AER has observed that there has been a significant increase in electricity network investment compared to historical levels of investment in the current five year regulatory cycle across the NEM. Figure 3.1 demonstrates that network investment over the current five year cycle is forecast at over \$7 billion for electricity transmission and \$35 billion for electricity distribution. In real terms, these forecasts represent an increase in electricity network investment from the previous regulatory period of around 82 percent in transmission, and 62 percent in distribution.

Figure 3.1 Electricity network investment



Source: AER, State of the Energy Market 2011, page 62

It is also evident the recent levels of electricity network investment in have been driven by a number of factors, which include:

- Load growth and rising peak demand (driven by the use of appliances such as air conditioners during summer heatwaves)
- Ageing assets, requiring significant replacement and reinforcement capital expenditure

- Other obligations related to network security, safety and reliability.

However, what is not so clear is whether all these increases in investment are efficient. Concerns with whether the regime is promoting efficient outcomes and whether the incentive based nature of the regime works effectively across all businesses in the NEM has led the AER to seek some changes to the regime and to enhance its internal capacity to undertake comparative benchmarking of network businesses. That said, techniques which use the incentive based approach, relying on 'revealed costs', will continue to be the preferred primary approach and this section describes how effective such an approach can be in regulating network businesses in Victoria, which appear to respond most directly to such incentives.

Effectiveness of revealed cost framework

The Victorian electricity distributors have been operating under a framework of incentives to reward cost efficiency/reliability improvements (or penalise cost inefficiency/poor reliability) for more than 10 years. This incentive framework is similar to that under the National Electricity Rules (Electricity Rules) where the AER has implemented:

- the Efficiency Benefit Sharing Scheme - a cost efficiency scheme for operating expenditure and
- the Service Target Performance Incentive Scheme - a service performance incentive scheme.

These AER schemes have the same objectives and similar incentive properties to the previous schemes adopted by the Victorian regulator, the Essential Services Commission of Victoria (ESCV).

Under the previous regulatory regime, the Victorian network businesses were incentivised to continuously seek out operating cost efficiencies over the regulatory period in which prices were set by the ESCV. Specifically, these businesses were able to retain any cost (in)efficiencies for a five year period irrespective of when in the regulatory period the (in)efficiency was incurred. This

provided a continuous incentive for network businesses to seek out efficiencies within the regulatory period. Relevantly, given the continuous incentive properties of the incentive framework, the businesses had incentives to reveal their efficient costs of service delivery. Importantly, these revealed costs are used to inform the regulator in determining the starting point for setting the ex ante forecast of efficient costs in the next regulatory period.

In relation to capital expenditure, a network business may be subject to a capital expenditure incentive mechanism, which operates in a similar way to the operating expenditure rolling incentive (and which as been the case for some network businesses in Victoria and South Australia over the past 10 years). However, even without a separate capital expenditure rolling incentive mechanism¹, a network business has an incentive to beat its capital expenditure allowance set by the regulator, as it is able to retain its return on and of capital over the regulatory period.

In addition, these businesses have also been subject to a service incentive framework to reward/penalise a business where its service performance improves or deteriorates to mitigate the potential for cost reductions to be made at the expense of service performance. Under the previous regulatory framework, performance targets were set at each regulatory reset and where actual performance varied from target performance an adjustment to regulated prices was made to reflect a financial reward/penalty for improved/reduced performance.

The AER has observed that over the last 10 years, the Victorian distribution network businesses' total actual capital and operating expenditures have been less than those forecast by the network businesses' and less than the allowances set by the previous regulator, the ESCV. In addition, these network businesses have broadly maintained relatively high standards of service, in terms of reliability

¹ A separate capital expenditure mechanism would have the effect of increasing the power of the incentive for the network business to keep its capital expenditure within the regulatory allowance. The issue of a stronger capital expenditure incentive is currently being considered as part of the AEMC's current review of the AER's Economic Regulation of Network Service Providers rule change proposal.

of supply compared to other jurisdictions. Figures 3.2 and 3.3 demonstrate the Victorian distribution network businesses' historical and forecast operating expenditure and high standards of service.

In the 2011-15 Victorian determination, the AER undertook trend analysis together with comparative benchmarking of the Victorian distribution network businesses' against distribution network businesses' in other jurisdictions. The Victorian distribution network businesses' historical level of capital expenditure was generally below previous regulatory benchmarks that had been set and also compared favourably on a range of partial productivity factors relative to other distribution network businesses in the NEM. As a result, the AER would expect that there is a reasonable likelihood that the historic unit cost and business practices of these distribution network businesses would be a reasonable indication of future efficient costs. In that sense these 'revealed costs' were taken as the starting point for consideration of future efficient costs. Relevantly, this also indicates that the privatised Victorian distribution network businesses have responded to the incentives to minimise costs (and maintain or improve reliability of the network). That said, this was only a starting point for consideration of future efficient costs, both because these businesses tended to systematically over forecast their expenditure needs (even if they did beat the lower regulatory benchmarks) and because the extent of comparative benchmarking that has been possible to date is still relatively limited. This means that there is still a need for more work on establishing and implementing superior benchmarking measures for future reviews – this is discussed further in section 4.

As well, when previous costs are taken as the starting point to assess future expenditure needs, it is also necessary to make adjustments to take account of changing circumstances which impact on the scale and scope of business activities. These changes include an ageing asset base, continuing growth in demand and customer numbers, increases in financing costs, wages and material costs, and changes in reliability, safety and other service obligations. This technique can be used for both operating expenditure and capital expenditure but tends to have greater application in the analysis of operating expenditure as capital expenditure frequently contains substantial lumpy elements that make establishing a baseline and adjusting for scale and scope changes more difficult. To the extent that the regulatory regime provides effective incentives for efficient investment, the AER can take

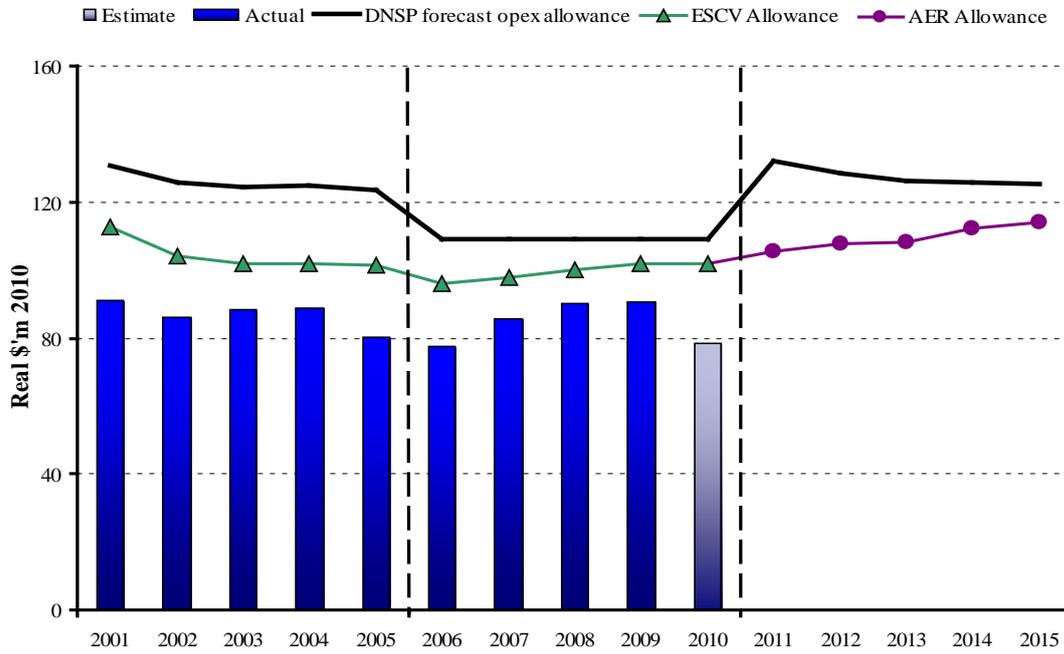
historic expenditure into account in setting the forecast allowance at the next regulatory reset. Figure 3.2 below shows the anticipated effect of the impact of changed requirements and operational circumstances as compared to historical expenditure trends.

More generally, the experience of the AER in regulating both privately and publicly owned network businesses points to the following observations:

- While privately-owned businesses appear to respond more directly to the incentive framework, thus allowing greater scope to use “revealed costs” at least as partial benchmarking approach, other benchmarking analysis may still be necessary where comparative analysis or other modelling of business investment proposals points to the need for further examination of the proposals.
- In the case of those businesses who may not respond as directly to the incentive framework, greater use of comparative benchmarking is still required as revealed costs (actual costs) are not likely to provide even a reasonable starting point. In this case, if the revealed costs are adopted as the starting point for an inefficient business, the business is in effect, rewarded for those inefficiencies.

To further its benchmarking capabilities, the AER is both enhancing its current suite of benchmark tools and developing more sophisticated benchmarking tools as well as improving its collection of consistent data from the sector – this is discussed in section 4. In addition, the AER is seeking amendments to the current rules framework under the Electricity Rules to clarify its ability to fully undertake benchmarking as part of its assessment of network businesses’ expenditure proposals.

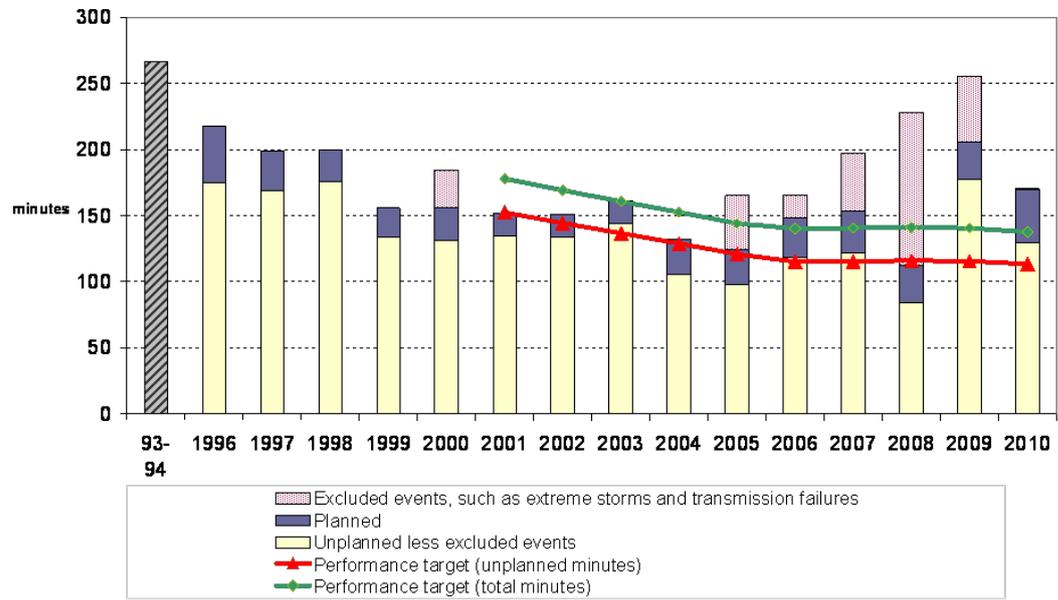
Figure 3.2 Victorian DNSP historical and forecast operating expenditure comparison (\$'m 2010)



Source: AER Final Decision – Victorian electricity distribution network service providers distribution determination 2011-15, October 2010. page 374.

Note: ESCV refers to the previous regulator - Essential Services Commission of Victoria

Figure 3.3 Victorian DNSPs- Total minutes off supply per Victorian customer



Source: AER analysis

4 The use and further development of benchmarking techniques by the AER

The Productivity Commission's Inquiry seeks to assess the use of benchmarking as a means of achieving the efficient delivery of network services and electricity infrastructure to meet the long-term interests of consumers.

Benchmarking is an analytical tool that, when used appropriately, can assist the regulator's assessment of the efficient level of expenditure sought by a network business in the forthcoming period. The AER considers benchmarking to be one of a suite of tools that informs the overall assessment of an expenditure proposal. Benchmarking is not a substitute for rigorous analysis and the exercise of judgement to determine expenditure allowances for a network business and cannot be used in a mechanistic fashion to directly determine expenditure allowances. However, when benchmarking is used prudently and carefully, and based on a robust specification that incorporates good quality data, it can be a very useful tool in the overall assessment of an expenditure proposal. There is evidence of other economic regulators, such as Ofgem in the United Kingdom, actively using benchmarking to inform and determine electricity network businesses' efficient operating and capital expenditure within an incentive based regulatory framework. The AER considers there is scope for such benchmarking techniques to be adopted in its assessment of the efficiency of the regulated network businesses' expenditure proposals during a revenue determination. To this end, the AER is developing greater capabilities in benchmarking through the collection, analysis and reporting of consistent data to allow for comparisons of network businesses' expenditures and service outcomes. The following section provides an overview of the AER's increasing use of benchmarking and the challenges faced in its implementation in regulatory determinations.

The AER's use of benchmarking

The national electricity objective seeks to 'promote efficient investment in, and use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality, reliability, safety and supply.' To this end, the AER makes revenue determinations for regulated transmission and distribution businesses. This involves forecasting the revenue requirement of a business to cover its efficient costs and provide a commercial return. Therefore, benchmarking is an important regulatory analytical tool that regulators can use to examine historic costs of the business and endeavours to look forward to estimate the efficient costs expected to prevail in the forthcoming regulatory period.

Benchmarking takes many distinct and separate forms, and many of these are outlined and their features explained in the Productivity Commission's issues paper. Similar to other economic regulators, the AER has used simpler forms of benchmarking comparisons such as ratio analysis as an internal tool to compare a regulated business' performance to itself and to its peers, to inform its revenue determinations. Arguably, the current regulatory framework limits to some extent the ability of the AER to apply benchmarks to the direct determination of revenue allowances because of the requirement for the AER to have regard to the 'individual circumstances of a network service provider' in the assessment of an efficient expenditure allowance. Part of the AER's rule change proposal to the AEMC on the Economic Regulation of Network Service Providers seeks to clarify the AER's ability to use benchmarking more widely. The AER seeks clarity in the Electricity Rules regarding the nature of the 'individual circumstances of a network service provider' that need to be taken into account in applying comparative benchmarking. The types of issues the AER and other regulators would typically take into consideration of 'individual circumstances' extends to exogenous network characteristics (such as location, topography, service obligations, size and density) but not to factors which are under the direct control of the network business. Even in the absence of the current requirement under the Electricity Rules, adjustments for exogenous factors that affect expenditure requirements would typically be the sort of adjustment made in any benchmarking calibration and normalisation exercise to ensure apples can be compared with apples.

A standard technique for reviewing the forecast costs of a mature, ongoing business is to assume that its past costs will inform likely future costs. Therefore, regulators including the AER typically collect time series data for as long a prior period as is practical and use these 'revealed costs' as a starting point for an analysis of potential future costs. Examples of this were discussed in section 3.

The AER also uses benchmarking to compare a network business' past performance and forecasts with other network businesses, as a reference for assessing efficiency. Where this benchmarking indicates that their capital expenditure may not be efficient, the AER undertakes a detailed review of the business' proposal. The AER's detailed review involves consideration of relevant documentation and the impact of factors expected to differ from the past and/or from other network businesses. The AER forms its judgement after considering submissions from the network business, other interested parties, and the AER's own analysis.

The AER recognises that forecast efficient costs may legitimately depart from those revealed through past performance, and compared with other network businesses. For example, network businesses may discover more efficient processes over time or may propose they can best achieve the capital expenditure objectives by incurring expenditure to implement new, more efficient processes, and include such expenditure in their proposed forecast capital expenditure. The AER generally assumes that operating processes would only be changed (from revealed costs, or otherwise efficient processes) if they are likely to result in efficiency gains (in the absence of any information to suggest other reasons for the change). Where the AER considers that future cost savings should result from capital expenditure investments, the AER takes this into consideration in determining the operating expenditure allowance.

Using benchmarking techniques in revenue determinations

In the NSW and Queensland revenue determination processes, the AER also conducted regression analysis of operational expenditure of the network businesses to seek to identify whether their operational expenditure was efficient. In each revenue determination decision problems were encountered with the use of this technique which revolved around matters including the data used,

the specification of the parameters to be modelled and consequently, the robustness of the results obtained.

These difficulties point to the need for a rigorous development of expenditure assessment approaches, in consultation with industry and the build up of a comprehensive set of data across the sector. It is also desirable that such expenditure approaches are developed outside of a particular determination process to allow sufficient time for the consideration of all relevant issues and consult more broadly with the sector. The AER's benchmarking development plans are outlined below.

A more specific example of the use of benchmarking techniques and the relationship to the use of 'revealed costs' expenditure assessment was in the Victorian electricity distribution revenue determination for 2011-15. In this case, the AER initially sought to use both the 'weighted average probability'² benchmark approach as well as a 'revealed costs' approach, to test the proposals for augmentation capital expenditure – expenditure associated with the growth in the network. Actual or 'revealed' costs were used for determining the starting point for whether the proposed capital expenditure sought by the network businesses satisfied the capital expenditure criteria set out in the Electricity Rules. The AER reviewed the network businesses' historical augmentation capital expenditure as a point of reference in testing whether the forecast future volumes of augmentation capital expenditure proposed by the network businesses appeared consistent with historical activity. Where substantial differences were apparent the AER sought to explore whether the businesses were able to adequately substantiate the relative variations in this component of capital expenditure, and the weighted probability approach was designed to further test the proposals in this way. The Electricity Rules also require that in the assessment of an efficient expenditure allowance, the AER

² For each distribution business, the AER's consultant developed an alternative forecast by assessing the apparent degree of discrepancy attributed to systemic over-forecasting over the previous regulatory periods, taking an average and using this amount to scale down the allowances to a lesser amount. This scaling factor was termed the 'weighted average probability.'

must take into account the circumstances of an individual network; such as differences related to intrinsic network characteristics, including location, topography, size and density. In applying the weighted average probability approach the AER sought to take such differences into account, consistent with the Rules.

A revealed cost approach provides some insight into the outcomes to be expected from the application of a network businesses' internal governance processes and can inform the assessment of unit costs. However, revealed costs may not be a sufficient test where unexplained or unsupported differences are apparent between the historical trend and the forecast trend. In such a case, other benchmarking tools are necessary, and the weighted average probability approach was adopted in this instance. This further assessment indicated that some \$300 million in capital allowances could not be explained by either historical factors or substantiated by claimed needs according to the weighted probability approach. However, while the weighted probability method pointed to an apparent over-forecast in augmentation capital expenditure, the approach was not able to be utilised to test the full range of projects across all businesses in this capital expenditure category, given timing and data limitations. As a result the AER could not fully rely on this approach to adjust the capital expenditure allowance to the full extent desired. Subsequent to the Victorian electricity distribution revenue determination, the AER has been developing more robust expenditure assessment tools, such as a new augmentation capital expenditure model, as well as more comprehensive data sets.

The AER has also developed and used a replacement expenditure tool ('repex model'), first applied in the Victorian determination, to assess the historical relationship between asset age and replacement expenditure. The AER then examined whether a business' forecast expenditure is consistent with its forecast asset age profile.

Further development of benchmarking techniques

The AER can readily apply benchmarks as an informative tool and regularly does so to varying degrees to inform the AER's assessment of expenditure proposals to direct or guide more targeted

scrutiny and analysis of relevant areas. However, it is also appropriate to improve the robustness and veracity of these benchmark techniques particularly if they are to be used to make more determinative assessments.

An important consideration in the use of a benchmark in a regulatory context is the quality of the data from which that benchmark is derived. The availability of data that is reported on a consistent basis is critical if the AER is to effectively use benchmarking to set regulatory allowances. In cases where a benchmark is directly relevant to the circumstances of the regulated business it is likely that the critical issue will be the quality of the data on which the benchmark is based, and not merely the provisions in the Electricity Rules.

Historically, data collection to support regulatory processes was undertaken by state based regulators on a broadly similar, but not identical basis. With the transition to a national regulator, the AER has an information strategy which seeks to collect, analyse and report consistent data, across the sectors it regulates. Consistent data will allow direct comparisons to be made regarding financial and service outcomes of the businesses and assists the AER in its assessment of the efficiency of the regulated businesses expenditure proposals.

The current focus of the networks information strategy includes:

- Reviewing the data definitions of key information required by the AER, to undertake its economic regulation function
- Developing a benchmarking tool for electricity network augmentation capital expenditure
- Developing benchmarking measures for electricity network operating expenditure and, if appropriate, total expenditure
- Develop benchmarking measures to compare the relative efficiency of regulated energy businesses, with an initial focus on electricity distribution
- Expanding the electricity distribution performance report to include network businesses from ACT, NSW, Queensland and SA for the 2010-11 report, Victorian businesses in the 2011-12 report, and Tasmanian businesses in the 2012-13 report.

- Developing a performance report for gas distribution networks, commencing with Victoria for 2009-10

Consistent with this strategy, the AER has been undertaking a review into the use of benchmarking as an assessment tool to review the efficiency of network businesses' proposed expenditures. This constitutes both an examination of the viability of its current use of benchmarking techniques – notably the use of partial performance indicators – but also an assessment of the viability of a number of alternatives and more complex benchmarking methods. The projects being undertaken by the AER in its benchmarking review include:

- a joint project with the ACCC's research branch to identify cost benchmarking methods currently applied by energy regulators overseas, and to review current academic literature on the theory and practical application of cost benchmarking;
- the continuing development of capital expenditure assessment tools to assess the reasonable level of replacement capital expenditure (as used in the Victorian and Tasmanian electricity distribution revenue determinations) and augmentation capital expenditure (currently under development) of distribution network service providers;
- the development of an enhanced and standardised set of partial performance indicators for use in future electricity distribution revenue determinations; and
- the development of a unit cost estimation system for electricity networks, based on engineering techniques for network planning.

As part of the process of research into the potential expansion of the AER's benchmarking program, the AER is planning to undertake substantive consultation with industry. Through this engagement process, the AER seeks to develop a shared understanding and acceptance of the benchmarking assessment techniques it employs.

The AER is presently preparing a package of background and issues papers to support an initial public forum or 'round table' in the immediate future. To facilitate the work of the Productivity Commission, arrangements will be made to share advanced drafts of these papers with the

Productivity Commission. These papers address a number of the detailed matters raised by the Productivity Commission's issues paper.

The AER believes that benchmarking is an essential tool for any energy regulator. This is evident as regulators both worldwide and domestically continue to support the use of benchmarking to assess efficient costs as a fundamental component of their regulatory activities. To this end, the AER is developing its capabilities to apply benchmarking techniques to expenditure proposals during a revenue determination.

5 Overview of the planning process for network investment

Investment in some form will always be required to meet and then maintain consumer's expectations of reliability over time. Such investment covers network augmentations (expansions) to meet rising demand, the replacement of ageing assets, investments driven by regulatory requirements on matters such as network reliability or by technological innovations that can improve network performance.

The intent of the Electricity Rules is that there should be effective incentives for efficient investment. This section of the submission provides an overview of the planning process for network investment and how this relates to revenue regulation.

At the start of a regulatory period, the AER approves a forecast of capital expenditure that 'reasonably reflects' the expenditure that is required to meet the prescribed objectives in the Electricity Rules. While the AER approves the total forecast of required capital expenditure for a five year period, the businesses are separately required to subject the more significant projects to some form of regulatory test. For example, the projects must be assessed for whether they are the most efficient way of meeting an identified need, or whether an alternative would be more efficient. There are separate assessment requirements for transmission and distribution network infrastructure investments.

Regulatory investment tests

Transmission network investment projects are assessed under the regulatory investment test for transmission (RIT-T) and associated guidelines that took effect in August 2010.³ The RIT-T is a cost-benefit analysis that assesses the economic efficiency and applicable reliability standards of

³ AER, *Regulatory investment test for transmission*, 2010

proposed transmission developments, including interconnectors. The test requires a business to consider the costs and NEM-wide benefits of a range of network and non-network options to meet an identified need. Transmission businesses must apply the RIT-T to most new network investments.

Currently, distribution investments are subject to a similar process under the Regulatory Test (version 3) which previously was applied to both transmission and distribution investments. In a distribution context, this test requires a business to determine that a proposed augmentation provides a least cost solution to meet network reliability standards. However, in September 2011, the AEMC commenced its consultation on a rule change to reform this test and introduce a regulatory test to distribution (RIT-D), similar to the RIT-T. The proposal also includes requirements on distribution businesses to release annual planning reports and maintain a demand side engagement strategy.

The RIT-T (and the regulatory test it replaced) and the RIT-D enhance the transparency of the network planning processes by requiring network businesses to publish certain information, explore non-network options in response to investment needs and engage in consultation throughout the assessment process. These tests maintain a discipline on businesses to consider the costs and benefits of network and non-network options and are one of a suite of tools that encourage efficient investment.

The RIT-T also helps ensure a level playing field between investment in contestable generation and natural monopoly transmission infrastructure. This aims to address concerns that over-building by transmission businesses may crowd-out efficient private commercial generation investment. For this reason the RIT-T is competitively neutral, and designed to ensure investment provides the greatest net economic benefit of all options available to meet an identified need. Such alternatives may include other network expansions, new generation capacity or demand management.

The AER is responsible for monitoring compliance and enforcing all aspects of the RIT-T and Regulatory Test. The AER has some concerns around the enforceability of these tests and the enforcement options available to the AER in the event of a suspected breach since none of the requirements regarding the need to undertake a RIT-T and the associated consultation requirements

are listed as civil penalty provisions under the National Electricity Regulations. The implication of this is that the only formal action the AER can take in relation to a suspected breach of these provisions is to seek an order from the Federal Court.

Transmission network planning reforms

The introduction of the RIT-T coincided with other reforms to transmission network planning arrangements. These reforms were in response to recommendations from the Energy Reform Implementation Group and the AEMC's National Transmission Planning Review. The reforms included the formation of the National Transmission Planner (NTP) in 2009, which sits within AEMO. The NTP provides a national strategic perspective on transmission planning and provides advice on the development of an efficient national grid. The NTP publishes an annual National Transmission Network Development Plan (NTNDP), providing an independent long-term strategic plan (at least 20 years) for the networks' efficient development. It includes nationally consistent information about transmission capabilities, congestion, and investment options under a range of market development scenarios. The NTNDP draws on and influences the Annual Planning Reports developed by network service providers, and the AER must have regard to both the Annual Planning Reports and NTNDP in revenue determinations. The result is designed to be a mutually reinforcing regime that seeks to ensure that the development of the networks take into consideration the implications of the national transmission flow paths.

In addition to these reforms, the Last Resort Planning Power (LRPP) provides a safeguard against transmission planning failure. It is designed to ensure efficient inter-regional transmission investment occurs in the long-term interests of consumers. Under this power, the AEMC may direct a transmission business to apply the RIT-T to a project that is likely to address any shortfall in inter-regional transmission investment. The AEMC reports annually on the matters it has considered in deciding whether or not to exercise this power.

When these reforms are considered in the context of the ongoing reviews and policy processes underway in the market, the AER considers that there are signs the framework is providing more

appropriate incentives for transmission network planning and investment to enhance the transparency of investment needs that allow for the development of an efficient national grid. However, as will be discussed below, further reform may be desirable.

6 Transmission interconnectors

The Productivity Commission has been asked to examine whether the regulatory regime in the NEM is delivering economically efficient investment in transmission interconnectors. A related question is whether the regulatory framework is providing for the efficient use of existing interconnectors.

Current network planning arrangements for interconnector investment

Section 5 highlighted the recent changes to transmission network planning arrangements designed to enhance transparency of investment needs and to ensure that the market benefits associated with investment proposals were considered, rather than proposals targeted at meeting individual state reliability needs. The AER considers that there are signs the framework is providing increased incentives to review the level of transmission interconnection between regions.

The AER notes that several transmission businesses have commenced RIT-T assessments of interconnector upgrades under the new framework; however none of the assessment processes have been completed. They include:

- a proposed upgrade to the Heywood interconnector between South Australia and Victoria. AEMO and ElectraNet completed a pre-feasibility study in February 2011 and have recently commenced the RIT-T assessment process. A draft assessment report is expected by July 2012.
- an investigation into the benefits of upgrading the Queensland to NSW interconnector (QNI) by Powerlink and TransGrid. An earlier study (in 2008) concluded it was premature to upgrade the QNI.

AEMO and TransGrid have also indicated they intend to investigate the benefits of upgrading the Victoria to New South Wales interconnector. The analysis for this investigation is not yet public.

Potential reforms to network planning arrangements

Analysing the public benefits of interconnector investment

Section 5 outlined the current network planning arrangements and noted there are a number of related reform processes underway. Despite these reviews, concerns have been raised that the framework, and particularly the RIT-T, may not result in beneficial investment occurring. The RIT-T requires an assessment of the costs of a project against the benefits accruing in the NEM. That is, it is a partial equilibrium analysis. Any second round effects on other areas of the economy (a general equilibrium analysis) are not taken into account. Paragraph 10 of the RIT-T, which reflects clause 5.6.5(B)(c) 9 of the Electricity Rules, states that ‘any cost or market benefit which cannot be measured as a cost or market benefit to generators, distribution network service providers, transmission network service providers or consumers of electricity may not be included in any analysis under the RIT-T.’ If these second round effects were included in the assessment, it is possible that some additional projects would be deemed suitable. It is not clear, however, if expanding the analysis in this way would favour interconnectors over other options under assessment.

In the 2011 NTNDP, AEMO called for reform to the national regulatory and transmission frameworks to ‘enable wider economic benefits beyond the electricity market to be considered, to maximise the value of these investments to Australia’. AEMO made its comments in the context of its assessment of NEMLink—a proposed backbone of network infrastructure to strengthen transmission links across the NEM. Under current expectations of economic and demand growth the project was found to be unlikely to deliver net economic benefits in the electricity market. AEMO considered that a wider perspective on economic impacts would find additional benefits beyond those in the electricity market alone. It has not reported on the scale of these benefits but considered they could potentially exceed the present value of NEMLink costs (around \$3.5 billion).

These comments follow on from work conducted by AEMO during the RIT-T development process to assess the benefits of using a general equilibrium model rather than the present partial equilibrium model. It considered a general equilibrium approach may deliver more appropriate results because:

- partial equilibrium analysis tends to emphasise marginal movements in bids, costs and dispatch in the wholesale spot market, which are challenging to model over the life of an asset and may not accurately reflect the overall benefits of an investment
- by considering movements in the average delivered price of electricity under a general equilibrium analysis of the broader economy, valid benefits may be identified that cannot otherwise be captured
- a general equilibrium analysis should be able to quantify the second round effects in the economy.

The AER considered at the time that a partial equilibrium analysis was an adequate means of analysing the potential benefits for the majority of transmission investments. Requiring a general equilibrium approach for all RIT-T assessments would require a level of analysis that would be disproportionate to the scale and likely impact of most investment options. Further, while a partial equilibrium model will only capture a portion of the benefits that could be shown by a general equilibrium analysis, it is not necessarily the case that a general equilibrium analysis will more favourably assess a proposed investment. Including broader general equilibrium effects may also adversely affect the competitive neutrality of the test in the context of not wanting transmission investment to 'crowd out' more efficient generation (or demand-response) investments. Finally, the 'black box' nature of general equilibrium modelling may adversely impact on the transparency of transmission planning and investment decisions. As part of this review, the Productivity Commission could consider whether further investigation of a general equilibrium model is worth pursuing, focusing on the benefits the model may provide and how this could be introduced into the assessment framework.

Transmission planning

The AEMC is undertaking a more general assessment of network planning arrangements through the Transmission Frameworks Review. The review is seeking to identify reform options that would optimise investment and operational decisions across generation and transmission. A number of reform options have been raised in response to stakeholder concerns that current arrangements for network development would not deliver sufficient new augmentations between regions. There are concerns that the existing arrangements may promote reliability-driven region-centric transmission investment and create incentives on transmission businesses to build rather than explore alternatives.

Options for incremental change include improving the consistency and transparency of planning approaches within the NEM. Options for more substantial change include coordinated planning across jurisdictions, either through harmonisation of planning approaches or through the introduction of a single independent NEM-wide planning body. The AER considers that the options for more substantial change should be actively considered.

Efficient use of existing interconnectors

Related to the question of whether the current framework delivers sufficient new interconnection is whether existing interconnectors are being used efficiently. Planning decisions by transmission businesses relating to their broader networks, as well as locational decisions of new generators, can significantly impact on interconnector flows. For example, in 2009 and 2010, there was network congestion in New South Wales associated with a 'system-normal' constraint to manage flows between Wallerawang and Mount Piper. This led to a reduction in imports into New South Wales across the interconnectors from Victoria and Queensland. However, since TransGrid completed its network upgrade in central west New South Wales (the Western 500 kV project), congestion has been reduced and flows across the interconnectors have improved.

The Transmission Frameworks Review is looking at options to encourage transmission and generation businesses to consider the impact of their planning decisions on the existing network

(including interconnectors). The options include congestion pricing (which would influence generation locational decisions) and reliability standards for interconnectors to ensure their capacity is maintained over time. The AER supported further consideration of these options.

The AER is also undertaking a review of the service target performance incentive scheme (STPIS) that applies to transmission businesses. The scheme aims to balance incentives on transmission businesses to reduce operating expenditure with the need to maintain and improve reliability for customers and minimise the market impact of transmission congestion. The scheme includes a reliability component and a market impact component. As part of this review, the AER proposes to introduce a network transfer capability parameter within the STPIS. This would encourage transmission businesses to devote resources to maintaining the capability of their existing network rather than focusing solely on new investments.

7 Conclusion

As the economic regulator for network businesses in the NEM, the AER brings a unique perspective to the issues the Productivity Commission's inquiry seeks to address. In particular, our revenue determinations for regulated transmission and distribution businesses involve forecasting the revenue requirements needed to cover its efficient costs and provide a commercial return. Incentive regulation is at the core of the regulatory framework and benchmarking is an important regulatory analytical tool that is a necessary complement, as it examines historic costs and endeavours to look forward to estimate the efficient costs of delivering services. To apply these techniques in our regulatory revenue determinations, the AER is developing greater capabilities in benchmarking through the collection, analysis and reporting of consistent data and undertaking industry consultation to develop our benchmarking assessment techniques. This work will enhance the AER's ability to use benchmarking as regulatory analytical tool to assess the efficiency of the regulated business expenditure proposals during a revenue determination.

The AER's submission has also provided an overview of the planning process for network investment and how this relates to revenue regulation. There have been a number of recent reforms designed to assess the efficiency of network investment. The AER considers that there are signs the framework is providing appropriate incentives for transmission network planning and investment to enhance the transparency of investment needs that allow for the development of an efficient national grid, but further more fundamental reforms could be considered.

The AER looks forward to working with the Productivity Commission and other stakeholders in adding value to this inquiry. The AER also notes that this inquiry should be considered in the context of the other review processes underway, which will also provide the opportunity to identify further reforms needed to address shortcomings in the current regulatory framework.