



AER Submission

Australian Energy Market Commission

Draft National Electricity Amendment

(Economic Regulation of Transmission Service) Rule 2006

March 2006

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Glossary

ABBRR	Annual Building Block Revenue Requirement
ABS	Australian Bureau of Statistics
ADJR Act	<i>Administrative Decisions (Judicial Review) Act 1977</i>
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ALR	Australian Law Reports
COAG	Council of Australian Governments
CPI	Consumer Price Index
Capex	Capital Expenditure
DRP	Draft Statement of Regulatory Principles
draft Rules	<i>Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006</i>
EPTA	Eligible Pass Through Amount
Expert Panel	Ministerial Council on Energy's Expert Panel on Energy Access Pricing
the Law	National Electricity Law
MAR	Maximum Allowable Revenue
MCE	Ministerial Council on Energy
MNSP	Market Network Service Provider
NEC	National Electricity Code
NEL	National Electricity Law
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NER	National Electricity Rules
NPV	Net Present Value
Ofgem	Office of Gas and Electricity Markets (UK)
Opex	Operating and Maintenance Expenditure
PPTA	Positive Pass Through Amount
PTRM	Post Tax Revenue Model
RAB	Regulatory Asset Base
the Rules	National Electricity Rules
S&P	Standard and Poor's

SRP	Statement of Principles for the Regulation of Electricity Transmission Revenues
TNSP	Transmission Network Service Provider
UK	United Kingdom
WACC	Weighted Average Cost of Capital

Part A

Introduction

The Australian Energy Regulator (AER) is responsible for regulating the revenues of Transmission Network Service Providers (TNSPs) in the National Electricity Market (NEM). As the Australian Energy Market Commission's (AEMC) review of the revenue setting Rules of Chapter 6 of the National Electricity Rules (the Rules) is directly relevant to the AER's role as transmission revenue regulator, the AER welcomes this opportunity to comment on the Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 (draft Rules).

Currently high level principles to guide the AER in its role in respect of TNSPs are set out in the Rules, with more detailed regulatory methodology specified in supporting guidelines, in particular the AER's Statement of Regulatory Principles (SRP).

This approach has delivered positive outcomes. It has facilitated unprecedented levels of network investment. Network reliability has improved. Productivity in the sector has improved markedly, especially where assets have been privatised.

The AEMC's draft Rules have codified aspects of the SRP, but have also introduced a number of changes. The resulting regulatory framework is a significant departure from current regulatory practice. Given the benefits of the current system it is not clear what problems the AEMC is attempting to address or what evidence led to these conclusions.¹

Clearly changes to the Rules are needed in a number of respects to align them with current accepted regulatory practice. Furthermore, departures from current practice are warranted to the extent that they address identified problems and move further towards best practice regulation. However, in these later instances best practice regulation requires the AEMC to be transparent, explaining the problems it sees with current practice and outlining how its changes will address these problems. Such rationale and transparency is missing from the draft Rules and accompanying Rules report. The AER encourages the AEMC to provide more explanation in this area.

This submission highlights and examines the areas where the draft Rules depart from current practice. There are three main changes.

First, the proposals dilute incentives for efficiency by introducing a new "re-opener" provision, removing incentives on the depreciation component of capital expenditure (capex) forecasts, and by limiting service standards incentives to one per cent of revenues. The dilution is so significant that it is unclear whether the proposed package will successfully deliver effective incentives for efficient investment. As such it is unclear that the draft Rules satisfy the NEM objective.

Second, the proposals introduce a form of the "propose-respond" model and the concept of "reasonable estimate". The AER notes that the Expert Panel appointed by the Ministerial Council on Energy (MCE) recently concluded that a propose-respond model is likely to alter

¹ Similar arguments are noted in the attached report by Firecone Ventures, *Providing certainty through codification: comments on the AEMC Rule Proposal*, March 2006, page 5.

the current balance of interests in favour of the regulated businesses.² This submission considers the possible implications of the “propose-respond” framework favoured in the draft Rules.

Third, the proposals aim to increase investment certainty through high levels of codification. The AER supports the AEMC’s objective of increasing certainty and supports the principle of basing the Rules on existing practice. At the same time this submission highlights some areas in which the high level of prescription may have unintended consequences, such as limiting the AER’s capacity to respond to the individual circumstances of each business.

This part of the submission provides a summary of the main issues and suggested amendments to the draft Rules. More detailed comments and suggested specific amendments to the draft Rules are provided in Part B of the submission. Reports of consultants engaged by the AER to analyse aspects of the draft Rules are provided in Part C.

Incentive regulation

The NEL requires the AEMC to establish an approach to regulation which provides effective incentives for efficient investment.

The AEMC notes that it has based its approach on the AER’s SRP³. The SRP establishes a straight-forward ex-ante incentive regime. The AER sets a revenue target and the TNSPs are rewarded for beating the target and penalised for exceeding it. The incentives to cut costs are balanced against the TNSPs’ statutory obligations and the service standards incentives prescribed in revenue determinations. The incentive regime was designed to provide investment certainty for the TNSPs, achieve efficient investment in transmission networks and efficient operation of the networks. The design of the incentive regime was analysed and consulted on in detail. Most TNSPs, user groups and other interested parties supported the regulator’s proposals.

The AEMC has made four significant changes to the incentive framework established by the SRP.

The first is the replacement of the “contingent project” regime by a new re-opening provision for capex. The AER’s objective in establishing the contingent project provision was to provide a safety net for foreseeable events where a project’s timing, cost or other factors beyond the control of the TNSP could have a large impact on the TNSPs’ capex requirements. An example is the cost uncertainty associated with investments to service a new large point load (such as a new smelter or a new generator). Often the TNSP knows about the project, but not relevant factors such as timing, scale or even location.

By contrast the AEMC’s re-opener provision is targeted at unforeseeable events. The AER notes that the existing pass through provisions already cover unforeseeable events and apply to capex as well as operating and maintenance expenditure (opex). The AER considers that

² Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, March 2006., Page 69,

³ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, page 7.

the existing pass-through provisions are an adequate mechanism to address unforeseeable events and that the new re-opener provision is not necessary. However, if the AEMC believes that there are problems with the pass-through arrangements, the AER would encourage the AEMC to modify them rather than create a new re-opener provision.

As currently drafted, the re-opener provision requires the AER to provide additional revenue to the TNSPs if they are likely to significantly overspend against their target, subject to certain conditions. The proposals do not distinguish between exogenous and endogenous events and do not take into account the efficiency of the business or its spending. As such, the re-opener provision could reasonably be viewed as being inconsistent with the National Electricity Law's (NEL) objective of promoting efficient investment.

Arguably the AER could review the efficiency of project costs proposed for pass through using the re-opener by conducting an ex-post prudency review. However, the provisions appear to allow the AER to only review information available at the time the TNSP made its decision. The AER's assessment is that the proposed ex-post review mechanism would not allow the AER to effectively review the efficiency of delivery of the project, or the TNSP's actions in response to new information.

Accordingly the AER does not support the re-opener provision proposed by the AEMC. The AER suggests that the AEMC recast the re-opener in the way originally intended with the contingent projects mechanism, that is, as a mechanism to address the cost uncertainty associated with some large foreseen investment projects. Part B of this submission includes detailed recommendations to give effect to this suggestion.

The incentive properties of the proposed re-opener provision are analysed in detail in the attached paper by Mountain Nuttall Consulting: *A comparison of the capital expenditure incentives in the AEMC's Draft Rules and in the AER's Statement of Regulatory Principles*.

The second change to the SRP's incentive scheme is the re-introduction of ex-post prudency assessments.⁴ By requiring an assessment of the efficiency of investment decisions after they have been made, an ex-post regime creates the risk of investment write downs. This gives rise to significant investment uncertainty and has the potential to deter efficient investment. So while the package outlined in the draft Rules may increase returns to TNSPs, at the same time it unnecessarily creates risks to TNSPs due to the ex-post revaluations. An ex-post approach is also highly intrusive and, by its nature, creates an adversarial relationship between the regulator and service provider. These concerns led the AER to move away from an ex-post approach in the SRP. The AER considers that efficient investment outcomes can be achieved through a well designed incentive regime and that ex-post prudency assessments are dysfunctional and not necessary.

The third proposal is to lock-in capped service standards incentives at +/-1% of the Maximum Allowable Revenue (MAR). This is based on the current approach adopted by the AER in its service standards incentive scheme.

The AER considers that an incentive based regime requires the regulator to balance cost-cutting incentives against service standards requirements and incentives. There is no

⁴ AEMC Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 clause 6.2.3

intrinsically ‘right’ answer to this balancing act and regulators need to adjust their incentive schemes as they learn from experience.

The Victorian Essential Services Commission, for example, recently adjusted both its cost cutting incentives and the power of its service standards incentive scheme even though it has been regulating for a decade. Similarly the Office of Gas and Electricity Markets (Ofgem) in the UK has regulated for 20 years but is still adjusting its incentive schemes. The AEMC’s proposals preclude the AER from making such adjustments over time.

The AER is currently developing a service standards scheme based on the market impact of the TNSPs’ actions. This could supplement the existing service standards scheme. However, the low powered incentives locked in by the AEMC will limit the AER’s capacity to use the scheme to encourage the more efficient investment spending and improved service outcomes hoped for by the AEMC. Issues associated with the proposed service standards incentive regime are outlined in detail in the attached paper by Dr. Darryl Biggar.⁵ Dr. Biggar notes that:

“once the 1% cap has been reached, the power of the incentive for further improvements in service quality (or the power of the incentive to prevent further deterioration in service quality) drops to zero.”⁶

Dr. Biggar adds that locking in rewards or penalties at +/- 1% of the MAR gives rise to unbalanced incentives to cut expenditure:

“The 1% cap on the financial reward or penalty under the service standards scheme is too low, for two reasons. First the financial reward or penalty associated with the expenditure efficiency incentive is likely to exceed 1% of revenue. This gives rise to unbalanced incentives to cut expenditure since the financial reward from a cut in expenditure may well exceed the financial penalty from a drop in service standards. Second, considering the service standards incentive alone, the size of the penalty required to induce adequate control of large adverse service standards events may well exceed 1% of revenue. The cap should be eliminated, or, if retained, it should be much larger, at around 10% of revenue.”⁷

Locking in incentives at such a low level also runs counter to best practice developments in Victoria and overseas, where the rewards and penalties associated with service standards performance have been increased.

The final change proposed by the AEMC is to reduce the power of incentives by removing incentives on the depreciation component of the capex forecasts.⁸ This reduces the power of the incentives by around 30% and results in very low powered incentives towards the end of the regulatory period. In the final year the reward for underspending (and the penalty for overspending) is just 3%.

⁵ Dr. Darryl Biggar, *The Incentive Implications of the Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006*.

⁶ Ibid, page 8.

⁷ Ibid, page 1.

⁸ AEMC Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 clause 6.2.5

The implications of removing the depreciation component of the capex forecasts on incentives are analysed further in the attached paper by Mountain Nuttall Consulting.

The AER does not support the dilution of incentives proposed by the AEMC. The package is a significant step back towards a cost of service model. The risk is a gradual move towards the inefficiencies, along with the associated high costs and prices that characterised the electricity sector in the 1980s and prompted energy reform in the 1990s.

Recommendation

To address the issues highlighted in this section, the AER recommends that the AEMC:

- **replace the capital expenditure re-opener provision with the ‘contingent projects’ regime established in the SRP and in conjunction remove the requirement for the AER to conduct ex-post prudency reviews.**
- **remove the restriction on the power of the service standards incentive scheme.**
- **reinstitute incentives on the depreciation component of capex and remove the requirement for the AER to adopt the TNSPs’ depreciation proposals.**

Balance of the regulatory regime

The AEMC has introduced a propose-respond model and a “reasonable estimate” test for assessing capex and opex proposals. The AEMC has also developed a list of factors which the AER must have regard to in assessing the reasonableness of the TNSP’s proposals.

Adopting specific criteria for each component of the revenue cap will provide a clearer and more predictable set of principles to guide service providers, regulators and review bodies, and is consistent with best practice regulation. The AER considers the list to be comprehensive and supports the AEMC’s proposal to include this list of factors in the Rules.

However, application of the criteria is complicated by the addition of the “reasonable estimate” criterion combined with the propose-respond model.

As pointed out by the Expert Panel “reasonable estimate” is a new concept which creates uncertainty.⁹ It is likely to lead to litigation to clarify the limitations it places on the AER’s decision. Further it is not clear what problem the AEMC is attempting to address by including this criterion. The AER believes that appropriate outcomes will be provided by it assessing whether the revenue application provides estimates consistent with the efficient capex and opex requirements of the service provider, taking into account the list of factors outlined in the clause. It would not appear to be necessary to introduce a “reasonable estimate” test and therefore the AER recommends its deletion from clauses 6.2.6, 6.2.7 and 6.2.17.

The Expert Panel also considered the propose-respond model concluding:

⁹ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, page 76.

“There is little doubt that a propose-respond model ... would lead to a systematic increase in the returns to regulated entities relative to the consider-decide model.”¹⁰

The exact impact of a propose-respond framework on prices in the context of the package of proposals developed by the AEMC is not clear. However, any price increases are unlikely to be accompanied by increased investment or improved service standards. Whilst the drivers of these are complex and cover a range of factors, including the TNSPs’ statutory obligations and service standards incentive schemes, the AEMC’s report does not change the underlying capex and service standards drivers.

One reason for introducing a propose-respond model may be to address issues related to perceptions of regulatory risk. However, as noted by the Expert Panel, the measures proposed may not be the best means of addressing such risks.

“Indeed it is this systematic upward bias in returns arising from a propose-respond approach that is its principal remedy to the risks of truncated returns and asymmetric risk from regulatory error... However, it is not clear that an upward bias in all regulatory rate of return outcomes ... is necessarily the best means of dealing with these concerns.”¹¹

Instead the Expert Panel suggests perceptions of regulatory risk could be addressed by ensuring that the objective for the regulator is appropriate, the guidance is clear and that the review mechanisms are appropriate. The Expert Panel further argues that the regulator should give explicit consideration to the costs of both under and over-investment, and under and over-utilisation of existing infrastructure. The AER agrees with the Expert Panel’s assessment that these measures are a more appropriate response to perceptions of regulatory risk than any upwards bias in regulatory returns.

The AER has two further concerns with the propose-respond model outlined in the draft Rules.

The first is that it works against achieving greater consistency in regulatory approach. The draft Rules give the TNSP the role of determining the basis upon which capex and opex is to be forecast. This is reflected in S6.9.1(b) and S6.9.2(b), which require a TNSP to describe the methodology used to derive capex and opex proposals.

The risk is a proliferation of different approaches for dealing with the same issue. Approaches may vary between TNSPs and between resets for each TNSP. As well as adding to the cost and complexity of the regulatory process, it works against consistency in the treatment of TNSPs or the monitoring of their performance.

The draft Rules give the AER the power to specify information requirements for revenue resets. In doing this the AEMC has recognised the need for the AER to have the appropriate ‘tools’ to undertake its assessment effectively. The proposal is a significant improvement on the current Rules and is supported by the AER. However, it does not fully address the consistency issue.

¹⁰ Ibid, page 68.

¹¹ Ibid, page 68.

The draft Rules require the TNSPs to submit the information required by the AER, but do not prevent them from (at the same time) submitting a proposal based on a different set of information. The AER understands that this mismatch is not intended. It can readily be addressed by requiring the AER to develop guidelines which specify the methodologies to be followed by TNSPs in developing capex and opex forecasts. As an example, the guidelines could set out a revealed cost approach to opex which asks the TNSPs to identify their current costs and forecast changes to those costs over the next regulatory period.

The second concern is the scope for regulatory gaming. The propose-respond model may encourage TNSPs to test the limits on the definition of “reasonable” rather than provide a genuine assessment of their requirements. The potential for gaming is exacerbated by the provision in the draft Rules which allows the TNSP to resubmit a revised revenue proposal any time up to 30 days following the draft decision. The Expert Panel has commented extensively on this issue. It argues that:

“...by allowing the ‘presumption’ of approval not just to apply to the initial consideration by the AER of whether a proposal is acceptable, but requiring it also to be applied in considering the regulated entity’s amended proposal lodged after the release of the draft determination, the AEMC approach does not provide any incentive to reduce regulatory game playing by entities lodging proposals.

Indeed the regulated entity has an incentive to make an ambit claim at the commencement of the process in order to discover whether it lies above the regulator’s estimate of a reasonable range, and if it does, to flush a counter proposal out from the regulator in the form of a draft determination. Under the Gas Code and under the AEMC’s draft Rules, this search process is at no bargaining cost to the regulated entity as it retains a capacity to make a final offer in response to the draft determination. Under the current interpretation of the Gas Code (and presumably the same would apply to the AEMC draft Rules), the regulator must accept such an offer if it lies within the regulator’s estimate of a reasonable range. The final offer will not of course be less than that proposed by the regulator.”¹²

The Expert Panel has provided a framework which addresses the concerns identified in this submission. Specifically the Expert Panel recommends that the draft Rules be amended to require the AER to “have regard to” the regulated entity’s proposal, any relevant submissions made, and any other relevant information and analysis to the extent that they are consistent with principles established by the AEMC. The AER supports the Expert Panel’s recommendation.

¹² Ibid, page 76.

Recommendation

To address the issues highlighted in this section, the AER recommends that the AEMC move away from the propose-respond model based on reasonable estimates of capex and opex outlined in the draft Rules. Specifically the AER recommends that in the draft determination, the AEMC:

- remove the requirement for the AER to accept “reasonable estimate” as outlined in clause 6.2.6(b) (for capex), 6.2.7 (b) (for opex) and 6.17.2 (for total revenue).
- require the AER to “have regard to” the remaining matters in clause 6.2.6(b) (for capex) and 6.2.7(b) (for opex) in making its revenue determinations.
- remove the ability of the service provider to submit a revised revenue proposal in the manner envisaged in clause 6.15.3.
- amend clause 6.12.2(a) to allow the AER to develop guidelines which specify the principles and methodologies to be followed by the TNSPs in developing capital expenditure and operating expenditure forecasts.

Innovation and flexibility

As acknowledged by the AEMC, the draft Rules are more extensive and detailed than the current Rules. For example the AEMC has prescribed Weighted Average Cost of Capital (WACC) parameters, opening Regulatory Asset Bases (RABs), details of tax and X-factor modelling, depreciation parameters, the incentive mechanism for capex and pass-through events in the draft Rules.

The stated rationale for the high level of prescription adopted is that it will reduce regulatory uncertainty over time. However, the attached report by Firecone Ventures questions whether certainty can be achieved in the way prescribed:

“(I)f there is a significant problem arising from uncertainty in the regulatory regime, then seeking a high level of codification is likely to be an ineffective and inefficient response. It is not possible to reduce the resolution of complex commercial processes to the successive application of binding Rules. The attempt to do so is likely to reduce rather than increase certainty and predictability.”¹³

Leaving aside the question of whether the level of detail in the draft Rules will provide certainty, the proposed level of prescription has some other disadvantages.

Some variables are likely to need periodic adjustment over time. The importance of adjusting service standards incentives has been discussed earlier in the submission. Regulators need to balance cost cutting incentives against service standards requirements and incentives. There is no intrinsically ‘right’ answer to this balancing act and regulators need to review outcomes and adjust their incentive schemes accordingly.

¹³ Firecone Ventures, *Providing certainty through codification: comments on the AEMC Rule Proposal*, March 2006, page 15.

Including details on the incentive mechanisms and other variables in the way proposed will not prevent change. However, it does create additional costs. Even minor changes to regulatory practice will require amendment to the Rules, with the associated process requirements.

The draft Rules also limit the AER's capacity to respond flexibly to the needs and circumstances of each TNSP and changing developments over time. Firecone Ventures notes that among the costs of adopting a highly codified regulatory approach are the "loss of flexibility on the part of the regulator, and the likely reduction in regulatory innovation."¹⁴ The need to retain flexibility to take into account TNSP-specific factors is also noted by the Expert Panel, which warns against a "one-size-fits-all" approach. It concludes that "the constraints imposed on or guidance given to the regulator should be the minimum necessary to achieve the objectives of the regime with some certainty."¹⁵

As an example of the benefits of flexibility, the regulator has agreed to include nominated dates for determining the nominal risk free rate in response to a request from TNSPs.¹⁶ Setting a specific date eliminates interest rate risk for the TNSPs. The draft Rules would prevent this by requiring the AER to set the interest rate as a moving average over a period of 5 to 40 days "which expires seven days before the publication of the AER's final decision on the TNSP's Revenue Proposal under clause 6.16.2(d)."¹⁷

The AER believes that certainty can be provided without resorting to the level of detail outlined in the draft Rules. In particular, this issue could be addressed by requiring the AER to issue binding guidelines. The AEMC has recognised the issue by requiring the AER to develop guidelines on a range of matters. However, the AER considers that the range of issues covered by guidelines should be broadened.

The AER specifically suggests that the draft Rules be amended to require the AER to produce guidelines on the following:

- *The process for TNSP revenue decisions.* The AER recognises that it is appropriate for the Rules to set high level guidance on the process, and supports setting a 12 month time limit on the review process along with a requirement that the AER issue draft and final decisions and consult with interested parties. However, specifying timeframes for each step in the decision making process does not reflect current practice and could compromise the quality of decisions. The AER recommends that the Rules require the AER to develop process guidelines consistent with high level guidance set out in the Rules.
- *Pass through provisions.* The AER only recently developed and applied the pass-through provisions now being adopted by the AEMC. It is premature to conclude whether or not further improvements can be made. Locking the provisions into the Rules makes adjustments more difficult if they prove necessary. However, after sufficient experience it may be possible to lock these provisions into the Rules.

¹⁴ Ibid, page 5.

¹⁵ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, pages 10-11.

¹⁶ The ACCC agreed to this with SPI Powernet.

¹⁷ AEMC Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 clause 6.2.4 (c)(2)(i).

Accordingly the AER recommends that the Rules require the AER to develop guidelines on the pass through provisions.

- *WACC parameters.* While these parameters are likely to need adjustment over time as market data changes, it is also important to deliver certainty. This issue is best resolved by having the regulator outline WACC parameter values in guidelines and then locking in the values for a set period of time. Accordingly the AER recommends that the Rules require the AER to develop guidelines on the WACC parameters.
- *Capital expenditure incentive mechanism.* This submission suggests specific changes to the Rules to address the AER's concern about the dilution of incentives proposed by the AEMC. However, the AER's preferred approach is for the Rules to require the AER to develop guidelines covering the capital expenditure incentive mechanism. The power and balance of incentives will need to be reviewed and potentially adjusted in light of actual outcomes. This can best be achieved by considering all elements of the incentive package, not just opex and service standards incentives.

Recommendation

To address the issues highlighted in this section, the AER recommends that the AEMC require the AER to issue binding guidelines on the WACC parameters, the pass-through provisions, the capital expenditure incentive mechanism and the process for TNSP revenue decisions.

Transparency

The draft Rules contain confidentiality provisions for data provided by TNSPs to the AER. The draft Rules do not allow the AER to publish information on the TNSPs' capex and opex outcomes, their performance against the targets set by the AER, the profit performance of their transmission operations, or any other information currently published by the AER in its annual regulatory accounts.

The AER considers that ensuring public access to this information is central to the integrity of the regulatory regime. It is noted that this information is published by all other jurisdictional regulators. The AER also considers that providing for the publication of such information assists in fulfilling the objective of a clear and transparent revenue regulation framework.

Recommendation

To address the issues highlighted in this section, the AER recommends that the AEMC remove the confidentiality clause in the information collection provisions (clause 6.19) and explicitly allow the AER to report on TNSP performance against expenditure targets, service standard targets, financial performance and other information that is in the public interest.

Summary of Proposals

The AER's proposals can be summarised as follows:

Incentives

The AER recommends that the AEMC:

- replace the capital expenditure re-opener provision with the 'contingent projects' regime established in the SRP and in conjunction remove the requirement for the AER to conduct ex-post prudency reviews.
- remove the restriction on the power of the service standards incentive scheme.
- reinstitute incentives on the depreciation component of capex and remove the requirement for the AER to adopt the TNSPs' depreciation proposals.

Balance

The AER recommends that the AEMC move away from the propose-respond model based on reasonable estimates of capex and opex outlined in the draft Rules. Specifically the AER recommends that in the draft determination, the AEMC:

- remove the requirement for the AER to accept "reasonable estimates" as outlined in clauses 6.2.6(b) (for capex), 6.2.7 (b) (for opex) and 6.17.2 (for total revenue).
- require the AER to "have regard to" the remaining matters in clauses 6.2.6(b) (for capex) and 6.2.7(b) (for opex) in making its revenue determinations.
- remove the ability of the service provider to submit a revised revenue proposal in the manner envisaged in clause 6.15.3.
- amend clause 6.12.2(a) to allow the AER to develop guidelines which specify the principles and methodologies to be followed by the TNSPs in developing capital expenditure and operating expenditure forecasts.

Innovation and flexibility

The AER recommends that the AEMC require the AER to issue binding guidelines on the WACC parameters, the pass-through provisions, the capital expenditure incentive mechanism and the process for TNSP revenue decisions.

Transparency

The AER recommends that the AEMC remove the confidentiality clause in the information collection provisions (clause 6.19) and explicitly allow the AER to report on TNSP performance against expenditure targets, service standard targets, financial performance and other information that is in the public interest.

Part B

Introduction to Part B

This part of the submission provides more detailed comments on the AEMC's proposals. This section works through each clause in the order set out in the AEMC's draft Rules. It focuses on the issues highlighted in Part A of the submission, but also provides comments on additional provisions of the draft Rules.

The AER's recommendations are boxed, with the key issues summarised at the start of each section.

Regulatory asset base (6.2.3)

- The AER supports a lock-in and roll forward approach for determining the Regulatory Asset Base but questions whether this is appropriately set in the Rules.
- In addition, there are some specific issues with the clause as drafted in relation to the ability to take account of the new definition of prescribed services, the use of actual CPI and the method for setting an asset base for a converting MNSP.

The AER supports a 'lock-in and roll forward' approach for determining the Regulatory Asset Base (RAB). The AER notes that the asset values set out in the draft Rules are taken from earlier ACCC revenue cap determinations. Consistent with the principal of locking in the opening RAB, the AER supports using the values determined in previous decisions as a starting point.

However, the draft Rules propose to change the definition of a 'prescribed service'. Therefore, assets that have been previously included in the RAB may now be excluded and vice versa. Therefore, it may be appropriate to consider the implications of the changed definition of a prescribed service before locking in the RAB. The AER believes this issue should be addressed at the reset of each TNSP's revenue cap.

Further, the degree of prescription in relation to the roll forward model (see 6.2.3(b) and (g)) raises some implementation issues. For example, clause 6.2.3(b)(3) requires the AER to develop a roll forward model that captures actual inflation from the start of one regulatory period to the next. This becomes a problem when considering the timing of a revenue cap determination and the publication of inflation data by the Australian Bureau of Statistics (ABS). Whilst the AER would prefer to apply actual inflation figures in its assessment of the appropriate RAB value, it is not possible to do so. The ABS publishes its CPI data almost a month after the end of the relevant quarter. Therefore if the AER was to set a RAB for the five years ending 30 June 2006, it would have to wait until approximately the end of July 2006 to receive the relevant data. Given the AER would be required, under the draft Rules, to make its revenue cap decision at least 2 months prior to the start of the regulatory period, it would not be possible to use the actual inflation outturn for the year prior to the first year of the regulatory period.

A better approach is to require the AER to deal with such matters through the roll forward model with high level guidance, rather than setting out all of the details in the Rules. This would provide certainty for the TNSP and allow the AER to use the expertise it has

accumulated in setting transmission revenue caps. This method would avoid the inherent difficulties with attempting to prescribe all possibilities in regard to setting a RAB.

It is recommended that the draft Rules be amended as follows:

- (a) 6.2.3(c)(1) should provide for the opening RAB values to be adjusted by the AER to reflect the extent to which assets are used to supply prescribed services;
- (b) 6.2.3(b) should not prescribe the type or measure of inflation to be used to adjust the RAB from year to year. This should be determined by the AER in the roll forward model.

Proposed clause 6.2.3(h) provides that where actual capex rolled into the opening RAB differs from forecast capex, no adjustment is to be made for the return on capital that was foregone (or allowed) on the underspend (or overspend). However, this provision does not refer to depreciation. The AEMC's reasons for excluding depreciation from the capex incentive regime are explained in its Rule Proposal Report:

“By incorporating depreciation into the incentive regime, a TNSP is rewarded (penalised) most for under- (over-)spending on short-lived assets. The TNSP becomes in effect subject to an expenditure cap (and an incentive regime) in respect of each different asset category, rather than in relation to its overall capital program. This provides an incentive for TNSPs to shift the allocation of reported actual capital expenditure away from short-lived assets (thereby gaining an efficiency benefit) and towards long-lived assets (incurring a penalty, which will be less than the benefit). This in turn implies the need for greater regulatory scrutiny of proposed depreciation profiles and the classification of assets for reporting purposes. The Commission considers that such incentives are inappropriate, and has therefore not adopted this approach in the Draft Rule.”¹⁸

The AER does not agree with this assessment. This issue is addressed in the attached report by Mountain Nuttall Consulting who note that:

- short-lived assets are a very small proportion of a TNSP's target capex (in the order of 5%). It is improbable that a TNSP will devote its attention to finding efficiencies in such a small proportion of its asset base;
- it is not expected that TNSPs will seek to re-allocate their reported capex (as opposed to capex actually incurred);
- removing depreciation will reduce the power of the incentive from approximately 21% to 15.5%.¹⁹

Given that the capex incentive regime proposed in the SRP was designed by the AER to be a 'low-powered' incentive regime,²⁰ its value will be substantially compromised if its incentives are further reduced to the extent proposed by the AEMC.

¹⁸ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page 87.

¹⁹ Mountain Nuttall Consulting: *A comparison of the capital expenditure incentives in the AEMC's Draft Rules and in the AER's Statement of Regulatory Principles*, Pages 13-14.

²⁰ SRP, page 57.

Since the potential risks of including depreciation in the capex incentive regime are low, the AER does not believe the exclusion of depreciation (with the weakening of incentives this would cause) is justified or desirable. The AER submits that this aspect of the capex incentive regime should be reinstated.

It is recommended that 6.2.3(h) be amended to refer to both return on capital *and* depreciation. Similar amendments will be required in 6.2.3(c)(1) and 6.2.3(c)(4)(iv).

The draft Rules seek to insert principles for the determination of the RAB in the case of conversion from an unregulated asset to regulated status.

The AEMC's draft Rules advocate that, in the case of a transmission system that is determined to be a prescribed service under clause 2.5.2(c), the value of the RAB to be regulated under a revenue cap determination should be the lesser of:

- (a) the prudent and efficient value of the assets that are used by the TNSP to provide those prescribed services, such value being determined by the AER; or
- (b) the sum of
 - i. the net present value of the revenue that it is expected would be earned by the TNSP over the remaining life of the assets; and
 - ii. the net present value of the market benefit of the services being determined to be prescribed services compared to being continued to be treated as services that are not prescribed (to the extent that such market benefit is not already included in the expected revenue).

The AER is concerned about the practical implementation of the proposals. Projecting wholesale market or contract prices and utilisation of the interconnector over the life of the asset is very difficult to do. ACCC staff considered this option in the context of Murraylink and rejected it because it involved significant implementation issues.

In addition, the proposal does not seem to deal with the issue that unregulated links can bypass the Chapter 5 process and provisions. This issue was raised during the Murraylink and Directlink processes and recognised by the MCE in its Energy Market Reform report of December 2003.

The AEMC has not discussed in detail the rationale for its chosen approach to the setting of the opening RAB for a Market Network Service Provider (MNSP) converting to regulated status. However, the AEMC's approach to the establishment of the RAB during a conversion application is a significant departure from the approach adopted in the ACCC's Murraylink and Directlink determinations. In both determinations, a regulatory test was utilised in determining the opening RAB. The approach used in determining an opening asset base for Directlink also sought to quantify the market benefits that would apply under a regulatory test approach. This ensures that users only pay for prudent and efficient investment.

It is recognised that the current Rules are complex and do not clearly state how the AER should determine RAB values in such situations, making it difficult to reach a reasonable value. However, it is not clear that the draft Rules simplify or improve on current arrangements.

The most important lesson that has been learned from the Murraylink and Directlink decisions is that there is no ‘one size fits all’ approach that can be sensibly prescribed for the valuation of a market network service that is converting to a prescribed service. There are certain principles that must, for the sake of consistency, be applied to this task. However, the optimal approach can vary depending on the circumstances relating to each interconnector.

The key principle is the need to ensure that ‘regulated’ and ‘unregulated’ interconnectors are treated in a fair and consistent manner, in particular, to ensure that a MNSP cannot use the conversion process to by-pass the requirements of Chapter 5 of the Rules. The ACCC and AER have, in the past, used a number of approaches to achieve this, including the value that is achieved by an application of the regulatory test and the economic value of the interconnector.

The AER submits that the Rules should prescribe the key principles to be applied in the conversion decision, while leaving the regulator with the ability to determine the manner in which the principles will be applied to specific cases.

Where the AER decides to classify a market network service as a prescribed service, **it is recommended** that the AER determine an opening RAB for the relevant transmission system in a manner that achieves consistency with the valuation of prescribed services under the Rules. In determining the opening RAB for the relevant transmission system, the AER may have regard to:

- the value that would be achieved by assessing the transmission system against the principles contained in the regulatory test;
- the economic value of the transmission system; and
- the optimised depreciated replacement value of the transmission system.

Ex-post review of capex (6.2.3(d))

- The AER considers that an ex-post review provision is not required as part of a package of properly designed incentive measures.

As noted in Part A of this submission, the AER has concerns with ex-post prudency reviews and does not believe that they are required in an effective incentive-based regulatory regime. By requiring an assessment of the efficiency of investment decisions after they have been made, an ex-post review creates the risk of investment write downs. This creates significant investment uncertainty and has the potential to deter efficient investment. An ex-post approach is also intrusive and by its nature creates an adversarial relationship between the regulator and service provider. These concerns led the AER to move away from an ex-post approach in the SRP.

The AER has proposed, in this submission, a package of measures designed to provide a transparent and predictable regime for the effective regulation of capital expenditure. As part of this package, the AER submits that the provisions of the draft Rules providing for ex-post review of capital expenditure should be deleted.

In addition to its threshold concerns with an ex-post regime, the AER has concerns with the provision as currently drafted. If the AEMC decides that the Rules should provide for ex-post review of capital expenditure, the AER submits that the changes to the draft Rules suggested below are essential.

The last words in clause 6.2.3(d) state:

“Except for the purposes of clause 6.2.3(c)(4)(ix), in determining the prudency or efficiency of capital expenditure the AER must only take into account information and analysis that the Transmission Network Service Provider could reasonably be expected to have considered or undertaken at the time that it undertook the relevant capital expenditure.”

While it is not entirely clear, this clause seems to suggest that any ex-post adjustment is to be focussed on the prudency and efficiency of the investment decision, rather than the prudency and efficiency of the actual investment.

Certainly it appears from the Rule report that this is the intent of the clause. It states that the:

“... Draft Rule also requires that the assessment of the prudency and efficiency of investment needs to take into account information that was available to the TNSP at the time the investment decision was made. This is to avoid opening up the TNSP to unnecessary risk that its actual investment costs will not be rolled into the RAB, where later information comes to hand or expected market developments do not materialise. This principle means that the Regulatory Test is not to be re-applied in assessing the prudency of investment.”²¹

The problems that this creates are demonstrated by the following hypothetical example. A TNSP makes a decision to undertake a major augmentation. The decision to undertake this

²¹ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page 59.

augmentation, based on the material available to the TNSP at the time it decided to do so, was prudent and efficient. However, the TNSP allows the scope and design of the project to substantially expand. Further, the project is mismanaged so that its cost significantly exceeds that which was forecast by the TNSP at the time it made the investment decision.

In this example, the factors that drove these cost increases were not known to the TNSP at the time it decided to undertake the project. Therefore, under the current drafting of the Rule, the AER does not seem to have the capacity to review the efficiency of the project implementation. In turn this reduces the incentives on the TNSP to manage its project implementation efficiently. The actual costs incurred, no matter how excessive, will be rolled into the RAB, and if the TNSP exhausts its capex allowance it can seek a re-opener for further capex allowances.

If the AEMC decides to proceed with ex-post prudency assessments, the AER recommends removing this limitation on the AER's ability to review the prudency and efficiency of capex.

It is recommended that the AEMC remove the requirement for the AER to conduct ex-post prudency reviews provided that the AER's recommendations on the capital expenditure incentive mechanism are adopted.

If the AEMC still deems it appropriate to proceed with ex-post prudency reviews, **it is recommended that** the regulator have the power to consider the prudency and efficiency of project implementation as part of its assessment of prudency and efficiency of capital expenditure under clause 6.2.3(d). This would be achieved by deleting the final paragraph in the clause.

Allowance for stranded asset risk (6.2.3(f))

- The AER considers that it is unnecessary and inappropriate to allow an additional premium for the risk for stranding assets in the form proposed by clause 6.2.3(f).

The draft Rules include a provision for the AER to determine a separate amount in the annual building block revenue requirement for a TNSP for each regulatory year of a regulatory control period so as to compensate that TNSP for the risk of the value of assets being removed from the regulatory asset base for the relevant transmission system, but only if it is satisfied that:

- (1) such risk is not otherwise addressed through another provision of the Rules.
- (2) the TNSP has taken all the steps that a prudent TNSP would take to manage that risk.
- (3) the total revenue cap for the TNSP for that regulatory control period does not adequately reflect risks that cannot be reasonably managed.

The AER contends that this provision may not be workable due to the lack of clarity in its drafting and the nature of the requirements to be met before compensation can be allowed.

Further, these provisions are redundant if the AEMC removes ex-post prudency assessments. Once assets are rolled into the asset base they remain there irrespective of whether or not they have been stranded. Accordingly it is not necessary to allow an additional premium as proposed in clause 6.2.3(f).

It is recommended that:

- Clause 6.2.3(f) be deleted.
- Reference to 6.2.3(f) be deleted from clause 6.2.2(a)(7).

Return on capital and rate of return (6.2.4)

- The proposed draft Rules prescribe WACC values to apply across all transmission revenue determinations.
- The AER considers that greater certainty can be provided in relation to WACC values if they are set out in binding guidelines which lock in values for 5 year periods, rather than being prescribed in the Rules.
- The AER considers that the determination of WACC parameters is a regulatory function.

The AER notes that the AEMC has prescribed WACC parameters in the draft Rules. The stated rationale for this high degree of prescription is that it will reduce regulatory uncertainty over time.

The AER supports the objective of providing certainty. However, the AER believes certainty can be achieved through the Rules requiring the AER to issue guidelines on WACC parameters and making those guidelines binding for regulatory decisions made by the AER. This would achieve the same level of certainty for stakeholders as locking in the WACC parameters in the Rules.

Indeed, if they were to apply for a fixed period, greater certainty about WACC parameters would be provided through the guidelines than under the draft Rules. Placing WACC values in the Rules leaves them vulnerable to change in the future as the AEMC is required to assess any Rule change application to amend WACC parameters that it receives.

The AER also considers that the WACC parameters are likely to need adjustment over time as market data changes. The AER believes that this is best achieved through guidelines developed by the body with the appropriate expertise. The discussion of credit ratings (set out below) illustrates that the determination of WACC parameters must balance the need for certainty with the ability to respond to developments in theory and changing circumstances in the market. This is consistent with best practice regulation. This is best achieved through a structure where the Rules do not prescribe WACC parameters, but instead require the regulator to do so. Certainty can then be provided by locking in the WACC parameters determined by the regulator for a fixed period of time. Accordingly the AER recommends that the Rules require the AER to develop guidelines on the WACC parameters.

A further benefit provided by this process would be a more streamlined transition to the AER setting WACC parameters from 1 July 2011, as set out in the draft Rules.

BBB credit rating

The AER has noted above its view that WACC parameters should be set in guidelines issued by the regulator. However, if the AEMC decides that WACC parameters should be prescribed in the Rules, the AER believes that the credit rating assumption included in the draft Rules needs to be amended.

Accepting the AEMC’s position that private companies should form the basis for the credit rating benchmark, the AER considers that a BBB credit rating is inconsistent with this approach in any event.

In prescribing WACC parameters, the AEMC has stated that it is elevating the parameters used in the SRP. However, the draft Rules depart from the content of the SRP by setting the benchmark credit rating for an electricity transmission business at BBB. The AER believes that this should be set at a credit rating of A.

In determining the appropriate benchmark credit rating to be used in electricity transmission revenue regulation, the AER believes it is necessary to first survey the existing credit ratings of government and private electricity transmission and distribution companies. Table 1 sets out the most recent (as of March 2006) publicly available Standard and Poor’s long-term credit ratings²² and gearing ratios for these companies.

Table 1: Credit ratings of electricity and gas network companies

Company	Business	Owner	Long-term rating	Gearing (%)
Ergon Energy	Dist	Gov	AA+	46.0
Country Energy	Dist	Gov	AA	67.8
EnergyAustralia	Trans/Dist	Gov	AA	52.5
Integral Energy	Dist	Gov	AA	54.7
SPI Powernet	Trans	Private/Gov	A+	76.8
SPI Australia	Dist	Private/Gov	A+	64.0
Australian Gas Light	Dist	Private	A	40.8
Citipower Trust	Dist	Private	A–	54.1
ETSA Utilities	Dist	Private	A–	64.1
Powercor Australia	Dist	Private	A–	38.1
ElectraNet	Trans	Private	BBB+	71.9
United Energy	Dist	Private	BBB	80.0
Average			A+ to A-	59.2

The table reveals the median credit rating for public and private electricity transmission and distribution companies is between A– and A+. Only ElectraNet and United Energy exhibit credit ratings of less than A–²³, and in both cases the lower credit ratings are associated with

²² Source: Standard and Poor’s, *Industry Report Card: Australian Utilities*, 2 November 2005. Standard and Poor’s does not provide credit ratings for Aurora Energy, Energex, TransGrid, Transend, Powerlink, Western Power, ActewAGL or Murraylink.

²³ The case of ElectraNet and United Energy is distinguishable on the grounds of its relatively high actual gearing ratio of 71.9 and 80.0 per cent respectively (cf the average actual gearing ratio of 59.2). A hypothetical reduction in gearing is likely to place upwards pressure on each company’s credit rating. Further, the recent

high gearing. Accordingly, the AER considers the appropriate benchmark credit rating in calculating a TNSP's debt margin is 'A'.

In terms of the data shown in table 1 the AER notes the potential upwards and downwards biases which are introduced by the inclusion of government entities and distribution companies respectively. The inclusion of government owned entities in the sample is likely to place upwards pressure on the overall credit rating.²⁴ Distribution companies, on the other hand, are regulated by price caps which are more likely to result in a weaker business profile and in all Australian states except for South Australia and Victoria, are bundled with retail operations which exhibit a riskier profile.²⁵ These factors are likely to place downwards pressure on the median credit rating.

The AER submits that the upwards bias balances out the downwards bias, and the credit rating of A derived from the above sample provides a fair and reasonable benchmark.

This conclusion is supported by the following statements from Standard and Poor's and Fitch Ratings that "the 'A' rated entities are generally stable network or transmission businesses."²⁶ Standard and Poor's also state that "the transmission company should enjoy stronger credit ratings than other players in the electricity chain, because of the strong regulatory environment and low operating risks currently evident in Australia."²⁷

The AER has engaged Associate Professor Martin Lally to investigate the most appropriate benchmark credit rating. Employing a regression approach, Associate Professor Lally has advised that the most appropriate credit rating for a wholly privately-owned electricity transmission business at a gearing level of 60 per cent is A-.²⁸ Whilst Associate Professor Lally concedes this estimate is subject to statistical uncertainty, the 95 per cent confidence interval (which ranges from the A+/A boundary to the BBB+/BBB boundary) clearly excludes the BBB credit rating favoured by the AEMC.

This conclusion also holds for the benchmark credit rating on a privately-owned company. Associate Professor Lally's analysis still rejects a BBB credit rating as an appropriate benchmark for private businesses, as it lies outside the acceptable range.

acquisition and restructure of United Energy would have affected its financial and business risk characteristics. As discussed below, these factors would be reflected in United Energy's credit rating of BBB in Table 1.

²⁴ Standard and Poor's note that the stronger AA credit rating is predominantly given to government owned utilities.

²⁵ According to Standard and Poor's, electricity retailers operate in a highly competitive market and their credit quality will always be at the riskier end of the credit spectrum: see Standard and Poor's, *Energy Australia and New Zealand*, p. 9. There are only a number of limited situations in which the existence of a retailing capacity would strengthen a distributor's standalone credit profile: see Fitch Ratings, p. 47.

²⁶ Standard and Poor's, *Australian and New Zealand Electric and Gas Utilities Ripe for Rationalization*, May 2002, p. 1.

²⁷ Fitch Ratings, *Australian Electricity Sector—at that Awkward Adolescence Stage*, March 2004, p. 47.

²⁸ Lally argues that an appropriate benchmark credit rating for all electricity transmission businesses should be based on a wholly private-owned business (which avoids an insufficient cost of debt for private businesses and inter-generational equity problems) without any adjustment for conservatism (margins should not be added to individual parameter estimates like credit ratings) as reflected in the decisions of a number of state regulators. See Martin Lally, *The Appropriate Credit Rating for Australian Electricity Transmission Businesses*, March 2006, pp. 4–6.

Taking into consideration statements from Standard and Poor's, Fitch Ratings and the independent expert advice from Associate Professor Martin Lally, it is clear that a benchmark credit rating of BBB for electricity transmission companies is unjustifiable and that a benchmark credit rating of A is more appropriate.

It is recommended that the draft Rules be amended to require the AER to issue binding guidelines on WACC parameters.

However, should the AEMC decide to proceed with an approach where WACC parameters are prescribed in the Rules, **it is recommended that**, consistent with the view that a benchmark BBB credit rating is inappropriate for electricity transmission regulatory decisions and given the absence of any evidence conclusively supporting the adoption of an alternative credit rating, the benchmark A credit rating outlined in the SRP should be retained.

Depreciation (6.2.5)

- The draft Rules currently limit the ability of the AER to review depreciation.
- The AER considers that the approach in the draft Rules is largely untested and may benefit from some degree of flexibility with regard to setting depreciation schedules to ensure that the long term interests of users of electricity are preserved.

The objectives of the depreciation component of the Post Tax Revenue Model (PTRM) are to allow the TNSP to recover a return of capital, whilst ensuring a smooth price path for consumers. In addition, a well designed overarching framework also serves to place incentives on a TNSP to maximise the useful life of its assets.

Under the current regulatory process, a TNSP submits a depreciation schedule (remaining asset value and remaining asset life) as part of its revenue application. To date, the depreciation schedule as provided by the TNSPs has rarely, if ever, been amended by the regulator.

The draft Rules require the TNSP to submit a depreciation schedule in line with codified principles. Should a proposal from a TNSP meet these principles, the regulator must accept that schedule.

The AER notes that a number of these principles are untested. For example, it is unclear whether the requirement to apply straight line depreciation to assets with a depreciated value in excess of \$20 million will create gaming opportunities by encouraging TNSPs to split projects valued over this threshold. Further, it is not clear whether allowing TNSPs to propose depreciation schedules will provide incentives for TNSPs to depreciate assets over inappropriate asset lives.

Therefore, while amendments to depreciation schedules have been extremely rare, given the untested nature of the draft Rules, it is suggested that the regulator retain the power to adjust depreciation schedules should it be proven there is a method of meeting the set principles which better serves the long term interests of consumers.

It is recommended that the draft Rules be amended to permit the AER to amend a TNSP's depreciation schedule should it be proven to meet the principles as set in the draft Rules in a manner which, in the opinion of the AER, better serves the long term interests of consumers.

Forecast capital and operating expenditure (6.2.6 – 6.2.7)

- Forecast capex and forecast opex are critical components of a TNSP's revenue cap.
- The AER is concerned that the draft Rules will permit a variety of different approaches to forecasting capex and opex which could undermine a consistent and predictable approach to determining these components of the revenue cap.
- The AER is also concerned that a "reasonable estimate" criterion for assessing forecast capex and opex could lead to uncertainty and a lack of predictability in regulatory outcomes.

Forecast opex and the return on forecast capex constitute a major component of a TNSP's revenue cap. In TransGrid's 2004/05-2008/09 revenue cap, these two components accounted for more than 30% of the total revenue.

The basis of capex and opex forecasts

Clauses 6.2.6(a) and 6.2.7(a) provide that a TNSP must submit, as part of its Revenue Proposal, forecasts of the capex and opex it considers is reasonably required to be undertaken in order to:

- (1) efficiently meet the expected demand for prescribed transmission services over that period;
- (2) comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
- (3) maintain the quality, reliability and security of supply of prescribed transmission services; and
- (4) maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

These forecasts must be made in accordance with, and comply with the requirements of, the AER's guidelines under 6.12.2. These guidelines must specify a range of detailed matters, including the information that is to accompany the Revenue Proposal and the requirement that it contain the matters specified in S6.9.1 (for capex) and S6.9.2 (for opex).

While the information to be provided in support of the Revenue Proposal is extensive, the Rules leave it entirely to the TNSP to determine the basis upon which capex and opex is to be forecast. This is reflected in S6.9.1(b) and S6.9.2(b), which require a TNSP to describe the methodology used to arrive at the forecasts.

This means that the AER could be faced with a variety of different approaches to the determination of capex and opex. Approaches may vary between TNSPs and between regulatory control periods for each TNSP. As well as adding to the cost and complexity of the regulatory process, the AEMC's draft Rules will discourage consistency in the treatment of TNSPs and the effective monitoring of their performance.

The AEMC has stated that its proposal aims to “improve the predictability and transparency, and over time, consistency, of revenue cap determinations.”²⁹ The AEMC argues that:

“Over time, the economic regulation of TNSPs will become consistent and predictable, thereby creating a stable and more certain investment environment. This stability and certainty will support sustaining security and reliability for all consumers.”³⁰

Similar views are expressed by the Expert Panel on Energy Access Pricing in its Draft Report to the MCE. The Panel states that:

“A regulatory environment that is conducive to desirable investments being made in a timely way is important. This means not only appropriate returns in the short term but that potential investors can be confident that sound substantial long term investment decisions can be based on a well understood and predictable regulatory regime and not rendered loss-making by subsequent regulatory intervention.

Equally important is the predictability of those decisions – that is, the development an approach that gives energy users and investors in transmission and distribution infrastructure confidence that access and pricing outcomes will be guided by known principles that are applied in a consistent manner.”³¹

The AER supports the objectives expressed by both the AEMC and the Expert Panel. However, these objectives will not be achieved by a regulatory regime that allows different approaches to forecasts that will determine as much as a third of the total revenue allowed under a revenue cap. While the Rules make provision for the AER to review the capex and opex forecasts submitted by a TNSP, they do not provide mechanisms to enable the AER to ensure appropriate consistency between TNSPs.

A lack of guidance at the commencement of the revenue cap process makes it difficult for any reasonable degree of consistency to be achieved in the approach taken to capex and opex forecasts. If each TNSP can take a different approach to these forecasts, it will be much harder for the AER to establish a transparent, consistent and predictable approach to their assessment.

It is acknowledged that some degree of flexibility is necessary to allow TNSPs to develop capex and opex forecasts that may be based on different management systems utilised by TNSPs. It is also essential that such guidance can adapt and evolve over time to accommodate innovation and improvement in these systems. The AER submits that the appropriate balance between the need for consistency and the need for flexibility can be achieved through the AER’s guidelines published under clause 6.12.2.

➤ **It is recommended that** clause 6.12.2(a) should be amended to allow the AER to develop binding guidelines which specify the principles and methodologies to be followed by the TNSPs in developing capital expenditure and operating expenditure forecasts.

²⁹ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page, page 14.

³⁰ Ibid, page 53.

³¹ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, page 53.

Approval of capex and opex forecasts

Clause 6.2.6(b) provides that the AER must accept a TNSP's forecast capex if:

- (1) the forecast capex is properly allocated to prescribed transmission services;
- (2) the forecast capex:
 - is identified as a reliability augmentation;
 - is necessary to enable the TNSP to comply with applicable regulatory obligations; or
 - has satisfied the regulatory test;
- (3) the total forecast has been determined by the AER to be a "reasonable estimate" of the TNSP's required capex, taking into account the matters listed in 6.2.6(b)(3); and
- (4) the forecasts and supporting information comply with the AER's guidelines under 6.12.2.

Clause 6.2.7(b) provides that the AER must accept a TNSP's forecast opex if:

- (1) the forecast opex is properly allocated to prescribed transmission services;
- (2) the total forecast has been determined by the AER to be a "reasonable estimate" of the TNSP's required opex, taking into account the matters listed in 6.2.7(b)(2); and
- (3) the forecasts and supporting information comply with the AER's guidelines under 6.12.2.

A critical element of both provisions is the requirement to approve "reasonable estimates" of required capex and opex. This element is singled out and repeated in clauses 6.17.2(b)(7) and (8). It appears that this criterion is repeated in clause 6.17.2(b) in order to emphasise that it is part of a 'propose/respond' model for the assessment of a revenue cap proposal. Setting out this criterion more than once and using different words, has the potential to create uncertainty in the interpretation and application of the Rules. In fact, this is prescribed as a criterion for approval three times - in clauses 6.2.6 and 6.2.7, in 6.17.2(b)(6), and again in 6.17.2(b)(7) and (8). Clauses 6.17.2(b)(7) and (8) are unnecessary and confusing. These sub-clauses should be deleted.

The Expert Panel, in its Draft Report to the MCE, notes a number of concerns with a 'propose/respond' model. It states:

"In the Panel's view the preferred approach is to maintain the consider-determine model in electricity and reintroduce it in gas, but to do so within a framework which provides clear principles (including a requirement to consider regulatory risk) to guide the decision maker, merits and judicial review and coverage arrangements which ensure that the riskier investments with lesser market power are excluded from price control. If a propose respond model is to be adopted it should be done in a way that relies on the 'reasonable estimate' formulation and minimises the opportunity for regulatory gaming."³²

³² Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, pages 73-74.

Accordingly the Panel recommends that the Rules:

- require the AER, in applying the principles determined by the AEMC in the making of a draft or final determination in relation to revenue/prices, to have regard to the regulated entity's proposal, any relevant submissions made, and any other relevant information and analysis to the extent that they are consistent with those principles; and
- not apply the formulation recommended by the Productivity Commission to replace section 8.31 (and section 8.6) of the existing Gas Code.

The majority of the Expert Panel did not favour a global presumption for regulatory decisions (either a 'proposed/respond' or a 'consider/decide' model).³³ Rather, the majority of the Expert Panel preferred an approach that would require the AER, in applying the principles determined by the AEMC in the making of a draft or final determination in relation to revenue or prices, to have regard to the regulated entity's proposal, any relevant submissions made, and any other relevant information and analysis to which the AER may have regard in accordance with the Rules.

The AER supports these views. A revenue cap consists of multiple different components. While these components may be inter-related, they are developed and assessed in different ways. A revenue decision does not easily lend itself to an overarching test that requires acceptance of, for example, a 'plausible' proposal or a proposal in a 'reasonable range'. Establishing the upper and lower boundaries of a 'reasonable range' is no less difficult than determining the most appropriate value for a component of a revenue cap.³⁴ Specific, well considered criteria for each component of the revenue cap will provide a much clearer and predictable set of principles to guide service providers, regulators and review bodies.

In the case of forecast opex and capex, the draft Rules set out a thorough and well considered list of factors to which the AER must have regard in deciding whether to approve a TNSP's forecast capex and opex (clause 6.2.6(b)(3)(i)-(x) and 6.2.7(b)(2)(i)-(x)). The AER supports the inclusion of the criteria in the Rules and the specific criteria proposed. The AER also supports the AEMC's decision not to include a plausible or reasonable range approach. Nevertheless, the AEMC has included a reasonable estimate approach which complicates the application of these criteria.

The Expert Panel stated, at page 76 of its Draft Report, that there is uncertainty as to how a "reasonable estimate" will be interpreted in law and practice. Adding this additional criterion creates a significant risk of extended argument and uncertainty around the interpretation and application of the test for the approval of forecast capex and opex.³⁵ While the AER must

³³ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Pages 79-80.

³⁴ It could be argued that the "reasonable estimate" test outlined in the draft Rules is different from a "reasonable range" approach. However, as noted by the Expert Panel it "is not clear whether a 'reasonable estimate' can be assessed without a regulator considering and discussing in its reasons for decision the range within which such an estimate might lie." Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, page 67.

³⁵ In *Australia and New Zealand Banking Group Ltd v Federal Commissioner of Taxation* (1994) 119 ALR 727 at 741, the Full Court of the Federal Court observed (in the context of a tax matter) that an "estimate" involves the formation of a bona fide judgment or estimation based on reason. A "reasonable estimate" (if this is a different concept) is an approximate calculation based on probabilities. However, it does not follow that this

obviously exercise its powers in a manner that is not unreasonable, this does not need to be repeated in the Rules. The addition of a “reasonable estimate” criterion will inevitably lead to debate, and possibly litigation, about the meaning and effect of these words. This uncertainty has the potential to undermine consistency and predictability in regulatory outcomes for an extended period. The AER submits that removal of the “reasonable estimate” criterion would strike a proper balance between regulation and rule making, and between TNSPs and the regulator. It would leave a detailed set of criteria to guide the regulator in the performance of its functions, while giving it sufficient ability to regulate the revenue that can be earned from prescribed services in accordance with the principles and objectives set down in the NEL.

It is recommended that the AEMC move away from the propose-respond model outlined in the draft Rules.

It is recommended that the term “reasonable estimate” should be removed from 6.2.6, 6.2.7 and 6.17.2, and that in deciding whether to approve the capex and opex forecasts submitted by a TNSP, the AER should be required to have regard to the remaining matters in clauses 6.2.6(b) (for capex) and 6.2.7(b) (for opex). Similar amendments should also be made to 6.15.1(a)(2) and (3), 6.16.1(a)(2) and (3) and 6.17.2(c).

construction would apply to the Rules. The draft Rules also set out a list of matters to which the AER must have regard in deciding whether to approve a TNSP’s forecast capex and opex. The phrase “reasonable estimate” must be read in this context.

Service target performance incentive scheme (6.2.10)

- The AER considers that the capping of the service target performance incentive scheme at +/- 1% of the MAR limits its ability to implement a performance incentive scheme that can drive more efficient market outcomes.

Current arrangements

At present, the AER has an established performance incentive scheme, which has been applied in seven transmission revenue cap decisions. This performance incentive scheme is based on the AER's Service Standards Guidelines, which form part of its Compendium of Regulatory Principles.

The AER's performance incentive scheme is aimed at reducing incentives for TNSPs to cut costs by reducing service standards. Under a revenue cap TNSPs receive a fixed revenue stream and the only way to maximise profit is to minimise costs. This approach to maximising profit can result in costs being reduced efficiently or at the cost of output or service levels.

The AER's current performance incentive scheme gives TNSPs an incentive to increase service standards with the aim of increasing their revenue caps. This means that the performance incentive scheme makes it less profitable for TNSPs to reduce output with an aim of reducing their costs.

To date the AER has limited the incentive to 1% of each TNSP's MAR, which reflects the relatively early stage of development of the service standards incentive scheme. However, there is flexibility under the current arrangements for the incentive to be altered as the scheme is further developed.

Rule proposal

The draft Rules require the AER to develop and publish a service target incentive scheme. The service target incentive scheme includes the following features:

- It should provide incentives for TNSPs to maximise the reliability of the system at times when it is most valued by users, and on transmission elements that are most important to determining spot prices.
- The reward / penalty adjustment to the TNSP's MAR is to be capped at +/-1%.
- The AER must develop and publish the first target incentive scheme by 31 December 2006 and may amend the scheme in accordance with the transmission guideline procedures.

The AER has a significant work plan to develop a market based service standards incentive scheme. The AER has already undertaken extensive work with the industry to develop measures for market impacts. In time, the AER considers that financial incentives will be able to be developed based on these measures. The AER believes that it is important that any market based measure is robust, otherwise the introduction of an incentive may have an unintended impact. At this stage the AER considers that it will be difficult to adequately address these issues by 31 December 2006.

Nonetheless, if the AEMC believes it appropriate for the Rules to prescribe a target date, the AER will be able to design a service target incentive scheme by 31 December 2007.

It is recommended that the deadline for completing the AER's service target performance incentive scheme guideline be extended to 31 December 2007.

The AER has gained a significant understanding of issues associated with the detailed implementation of a performance incentive scheme that could assist the AEMC further develop the draft Rules. Some discussion of these issues is outlined below.

Cap and collars

The AER notes that the proposed incentive is capped at +/-1% of the MAR. The AEMC notes that the service standards incentive scheme should:

*"...ensure that TNSPs have effective incentives to provide greater reliability of the system at times when the system is most valued and in relation to those elements that are most important to determining spot prices."*³⁶

The AER has adopted a 1% incentive cap and collar in its service standards guidelines. However the guidelines allow the flexibility of a different collar or cap if the need arose for a specific revenue cap.

The AER considers that a regime which locks in rewards and penalties at +/- 1% of the MAR would appear to deliver very few incentives for TNSPs to pursue efficiency gains. Indeed, it is questionable whether such a weak incentive regime will have any great impact on the TNSPs' behaviour.

As noted above, the AER is currently developing a service standards scheme based on the market impact of the TNSPs' actions. The low powered incentives locked in by the AEMC will limit the AER's capacity to use the scheme to encourage the more efficient investment spending and improved service outcomes hoped for by the AEMC. Issues associated with the proposed service standards incentive regime are outlined in detail in the attached paper by Dr. Darryl Biggar.³⁷ Dr. Biggar notes that:

*"once the 1% cap has been reached, the power of the incentive for further improvements in service quality (or the power of the incentive to prevent further deterioration in service quality) drops to zero."*³⁸

Dr Biggar adds that locking in rewards or penalties at +/- 1% of the MAR gives rise to unbalanced incentives to cut expenditure:

"The 1% cap on the financial reward or penalty under the service standards scheme is too low, for two reasons. First the financial reward or penalty associated with the expenditure

³⁶ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page 83.

³⁷ Dr. Darryl Biggar, *The Incentive Implications of the Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006*.

³⁸ *Ibid*, page 8.

*efficiency incentive is likely to exceed 1% of revenue. This gives rise to unbalanced incentives to cut expenditure since the financial reward from a cut in expenditure may well exceed the financial penalty from a drop in service standards. Second, considering the service standards incentive alone, the size of the penalty required to induce adequate control of large adverse service standards events may well exceed 1% of revenue. The cap should be eliminated, or, if retained, it should be much larger, at around 10% of revenue”.*³⁹

Locking in incentives at such a low level also runs counter to best practice developments in Victoria and overseas, where the rewards and penalties associated with service standards performance have been increased.

It is therefore recommended that the AEMC remove the restriction on the power of the service standards regime.

It is recommended that the AEMC remove the restriction on the power of the service standards incentive scheme by deleting clause 6.2.10(a)(3).

Market impact

The draft Rules note that the service target performance incentive scheme should provide incentives for the TNSP to improve or maintain the reliability of the elements of the transmission network most important in determining the ‘spot price.’

The AER has undertaken extensive work to identify the transmission constraints that are having the greatest market impact. Most of this work is based on actual dispatch data and constraint equations used by the National Electricity Market Dispatch Engine (NEMDE). This work indicates that focusing solely on ‘spot market’ outcomes may not capture all market outcomes that should be considered in the development of a service standards incentive regime.

For example, the AEMC Rule Report notes that:

“... there may be a trade off between:

- *Minimising costs to the market in the short term, which may be achieved by deferring the outage; and*
- *Maintaining the long term credibility and value of the published outage schedule in order to encourage participants to mitigate their costs of planned transmission outages.”*⁴⁰

If the AER is restricted to providing an incentive on the basis of the spot market it would appear to be unable to address this trade-off in the proposed incentive scheme. Therefore, the AER considers that ‘market impacts’ rather than ‘spot market’ outcomes should be taken into account in the development of the service target performance incentive scheme.

³⁹ Ibid, page 1.

⁴⁰ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page 83.

It is recommended that clause 6.2.10(a)(1)(ii) be amended to require that the *service target performance incentive scheme* provide incentives for each TNSP to improve and maintain the reliability of those elements of the *transmission system* that are likely to have the greatest market impacts.

X-factor (6.2.11)

- The AER considers that there may be some benefit in continuing to allow oversight of the X-factor by the regulator as the best method of ensuring that the needs of users are appropriately considered.

There are serious questions about the role of the X-factor and the manner in which it is determined.

In its report, the AEMC states:

“Under the Commission’s Propose-respond process, it is the TNSP that will propose the X-factor for each year of the regulatory period. The AER must approve this X-factor, providing that it complies with the principles set out in the Rules, and the AER’s published model. An issue for the Commission is whether the Rule Proposal should incorporate any restrictions on the X-factors to be proposed by the TNSPs, such as requiring the X-factors to be equal in each year. Such restrictions are typically adopted by regulators in order to smooth the impact on pricing in each year.

There are currently restrictions in the Rules that limit the impact on price changes from any one year to the next. The Commission’s initial view is that additional restrictions on the X-factors do not appear necessary, and the TNSP should have the flexibility to propose the revenue profile over the period that it considers best reflects the needs of its users. The Commission expects that the TNSP would consider the impact on users as part of that decision. However, the Commission expects to reconsider the question of whether restrictions should be included in the Rules in relation to the X-factors once it has reviewed the pricing provisions in Chapter 6 of the NER, and in particular Rule 6.5.5.”⁴¹

While the draft Rules require the AER to determine a “CPI-X methodology”, the components of the CPI-X methodology are prescribed in the draft Rules. Namely, the way in which CPI is measured is already prescribed, as is the X-factor. The X-factor must be such that the net present value (NPV) of the MAR for each year equals the NPV of the annual building block revenue requirement (ABBRR) for each year.

The AEMC’s reasoning for this approach seems inconsistent. On the one hand the AEMC intends to give weight to the needs of users, but on the other hand it proposes to leave the decision to the TNSPs. A rational TNSP will choose a revenue profile that meets *its own* needs. If users had the ability to respond to this, it is unlikely the networks would need to be regulated. The AEMC’s expectation that the TNSP will consider the impact on users will amount to nothing if it cannot be enforced. The AER believes that the best way to address these concerns is by giving the regulator the ability to set X-factors.

It is recommended that clause 6.2.11 be amended to provide that the X-factors are to be determined by the AER having regard to the criteria in 6.2.11(b).

⁴¹ AEMC, *Review of the Electricity Transmission Revenue and Pricing Rules, Transmission Revenue, Rule Proposal Report*, Page 73.

Reopening of revenue cap for capital expenditure (6.2.12)

- The AER considers that the ability to reopen a revenue cap in the manner drafted by the AEMC provides limited incentive on a TNSP to efficiently undertake projects included in the ex-ante cap.

The AER does not support the re-opener provision as proposed by the AEMC. The AER recommends that the contingent project framework outlined in the SRP be retained.

The re-opener provision, as currently drafted, provides limited incentive on a TNSP to implement projects efficiently and does not provide scope for the regulator to consider the efficiency of capex already spent prior to making a re-opener decision.

By way of example, consider two TNSPs that have an ex-ante capex cap of \$100 million and both have a requirement to spend \$100 million to meet their statutory reliability obligations. TNSP 1 undertakes its capital expenditure program and fully expends the ex-ante cap. TNSP 2 undertakes the same program, but does so more efficiently, only spending \$80 million. If an unforeseen \$20 million project is required prior to the end of this regulatory control period, under the current drafting of 6.2.12, only TNSP 1 would be entitled to a pass through. This is the case as TNSP 2 could fit the project under the ex-ante cap as a result of efficiently undertaking its capital expenditure program.

This would appear to be a perverse outcome and highlights the benefit of the contingent project framework, as it sits outside the revenue cap process. The contingent project framework allows TNSPs to be rewarded for efficiencies, even in the event that a project that is not in the original ex-ante cap is required. This does require a project to be foreseen, but as noted by participants at the AEMC's public forum on this issue, this is not an unrealistic expectation.

It is recommended the AEMC remove the re-opener provision as drafted and retain the contingent project framework in the manner described below.

Principles relating to contingent projects

It is proposed that a further clause be added (possibly after 6.2.6) to make provision for contingent projects in the following terms:

- (a) A Revenue Proposal may identify projects (“contingent projects”):
 - (i) which the TNSP may need to undertake in the forthcoming regulatory control period; and
 - (ii) which do not satisfy any of the criteria in 6.2.6(b)(2).
- (b) The AER must decide whether to approve the contingent projects identified by the TNSP having regard to:

- (i) the information included in or accompanying the submission of the Revenue Proposal;
 - (ii) the need to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
 - (iii) submissions received in the course of consulting on the Revenue Proposal;
 - (iv) such analysis as is undertaken by or for the AER and is published prior to or as part of the draft decision of the AER on the Revenue Proposal under clause 6.15.1(a) or the final decision of the AER on the Revenue Proposal under clause 6.16.1(a) (as the case may be);
 - (v) the actual and expected capital expenditure of the Transmission Network Service Provider during any preceding regulatory control periods;
 - (vi) the extent to which contingent projects have been triggered during any preceding regulatory control periods;
 - (vii) its assessment of the forecast drivers for contingent projects and the probability that the contingent project will be necessary during the forthcoming regulatory control period;
 - (viii) the extent to which the drivers of contingent projects can be satisfied by forecast capital expenditure and efficient substitution possibilities between operating and capital expenditure;
 - (ix) whether the forecast contingent projects and the information provided in relation to them comply with the requirements of the guidelines made under clause 6.12.1(c).
- (c) For the avoidance of doubt, the AER can specify contingent projects and trigger events not proposed by the TNSP in its Revenue Proposal.

Specification of contingent projects in the transmission determination

Contingent projects must be defined in the transmission determination. In order to achieve this, the following amendments are proposed:

6.11(a) - The Revenue Proposal must specify any contingent projects and the trigger events for each project.

6.12.2 - The AER's guidelines must specify that the Revenue Proposal must identify those projects that the TNSP proposes to specify as contingent projects.

S6.9.1 - The Revenue Proposal must also contain:

- (a) a definition of each contingent project and a description of the proposed trigger events for each contingent project;

- (b) an explanation of the drivers for each contingent project and the probability of each contingent project being necessary in the forthcoming regulatory control period; and
 - (c) an estimate of the likely cost and timing of each contingent project.
- 6.15.1 - The AER must, in its draft decision, determine whether it approves the contingent projects and the trigger events proposed by the TNSP. If approval is not given, the AER must specify the contingent projects and trigger events it proposes to approve having regard to the criteria listed above.
- 6.16.1 - The AER must, in its final decision, determine whether it approves the contingent projects and the trigger events proposed by the TNSP. If approval is not given, the AER must specify the contingent projects and trigger events it proposes to approve having regard to the criteria listed above.

Implementation of contingent projects

Contingent projects will be triggered by the occurrence of the trigger events specified in the transmission determination. There is a need for a process to determine whether a contingent project has been triggered, the amount that should be allowed for undertaking the contingent project and the timeframe over which this allowance should be added to the TNSP's MAR. In order to achieve this, it is proposed that a further provision be inserted (possibly within clause 6.2.3) providing for contingent project allowances to be approved as follows:

- (a) a TNSP may notify the AER if it believes a trigger event has occurred or is going to occur;
- (b) once the AER has received notice from the TNSP, it must:
 - (i) decide whether the trigger event has occurred or is going to occur;
 - (ii) if so, determine the forecast capital cost of undertaking the contingent project and the period over which this cost is forecast to be incurred ("the incentive period"); and
 - (iii) determine the amount (the "contingent project allowance") to be added to the TNSP's MAR for each regulatory year in accordance with clause 6.2.2(a), which is to consist of:
 - (A) a return on the forecast capital cost determined under (ii); and
 - (B) depreciation on the forecast capital cost determined under (ii);
- (c) the AER must, in accordance with the transmission guideline procedures, publish contingent project guidelines that specify:
 - (i) the process for determining the matters described in (b) above;

- (ii) the criteria for determining the forecast capital cost of undertaking the contingent project and the incentive period. These criteria must be consistent with clause 6.2.6;
 - (iii) the basis for determining the contingent project allowance, which must be consistent with clauses 6.2.4 and 6.2.5.
- (d) for the avoidance of doubt, an incentive period can extend beyond the regulatory control period in which the trigger event occurs, and the AER can determine that a contingent project allowance should be added to the TNSP's MAR for regulatory years in the next regulatory control period.

Effect on Maximum Allowed Revenue

The total of any contingent project allowances approved by the AER for each year of a regulatory control period should be added to the TNSP's MAR for each of those years (the TNSP's RAB is only adjusted at the end of the incentive period). In order to achieve this, the following amendment is proposed:

- 6.2.2(a) – A further building block should be added, consisting of any contingent project allowance approved by the AER for that regulatory year.

Adjustment to the RAB

At the end of the incentive period for a contingent period, the TNSP's RAB will be adjusted for the actual capital cost incurred in undertaking the contingent project. This is subject to the incentives embodied in proposed clause 6.2.3(h), to achieve this, the following amendment is proposed:

- 6.2.3(g) – the roll forward model must provide for the RAB to be increased by the depreciated value of the capital cost incurred by a TNSP in undertaking a contingent project during an incentive period that ends in the previous regulatory year. The amount to be added to the RAB is to be determined by the AER in accordance with clause 6.2.3(h).

Revocation of revenue cap (6.2.13)

6.2.13(a)(2) – re-opening the revenue cap for material error

- The draft Rules allow a revenue cap to be reviewed on an on-going basis. As a result the AER considers that the revenue cap process will never truly be finalised thereby creating unnecessary risk and uncertainty for stakeholders.

Under clause 6.2.13(a)(2) the AER may revoke a revenue cap during a regulatory control period where it appears to the AER that there was a material error in the setting of the total revenue cap and the prior written consent of the relevant TNSP has been obtained by the AER. This is a modification of the existing Rules, which also require the consent of affected persons (6.2.4(d)(2)). This requirement has been removed.

The AER submits that the Rules should not permit re-opening of a revenue cap for all types of error (whether material or not). Where a party believes there has been an error in the setting of a revenue cap, that party should certainly be able to seek review of the decision to rectify that error. A revenue cap determination is subject to judicial review under the *Administrative Decisions (Judicial Review) Act 1977* (ADJR Act). There have also been proposals published in recent months for such decisions to be subject to merits review. However, under either avenue of appeal, there will be a limited period within which an application must be made.

The precise nature of the “error” for which a revenue cap could be re-opened has not been specified, but it could presumably extend to the type of error that would be reviewable under the ADJR Act, eg. an error of law, a procedural error, or jurisdictional error. It might even be alleged that the forecasts used by the AER were erroneous. Since a refusal by the AER to re-open a revenue cap would itself be a reviewable decision, a provision such as the one proposed by the AEMC would, in effect, remove the time limit in which an application for judicial review must be made. At any time a person could allege that there was an error in setting the revenue cap. If the AER did not agree, the refusal to re-open the revenue cap could be appealed.

This change means that a revenue cap will never truly be final. Neither service providers nor users can assume that a regulatory decision is final if, *at any time*, a person can allege that the decision has an “error”. The AER will be required to assess and determine each one of these allegations, and each decision will be subject to judicial review. Introducing this contingency into transmission network pricing will create an unacceptable degree of uncertainty and risk in the NEM.

There is an exception to this principle in cases where there has been a ‘slip’ in the revenue cap determination. In making a decision as complicated as a revenue cap, there is potential for errors to be made in, for example, a spreadsheet calculation or in the application of a formula. Errors such as these are not controversial. The AER recognises the need to rectify such errors without forcing an affected party to seek review of the decision.

While a court can rectify a slip in its own judgment, it is not clear that the AER has the power to rectify a similar error in a revenue cap. Accordingly, the AER recommends that the proposed clause 6.2.13(a)(2) be replaced with a provision allowing for a revenue cap to be re-

opened for such errors. The types of error for which re-opening should be allowed are suitably described in section 30 of the uniform Commercial Arbitration Acts. Neither time limits nor consent should be factors in the rectification of such errors.

It is recommended that the AEMC amend clause 6.2.13(a)(2) to provide for a revenue cap to be re-opened where it contains:

- (a) a clerical mistake;
- (b) an error arising from an accidental slip or omission;
- (c) a material miscalculation of figures or a material mistake in the description of any person, thing or matter referred to in the transmission determination; or
- (d) a defect in form.

Cost pass throughs (6.2.14)

- The draft Rules prescribe the events in relation to which costs may be passed through.
- Under this approach, the AER cannot consider the individual or changing circumstances of TNSPs.
- The draft Rules also shorten the time in which the AER is required to consider a pass through application.

The draft Rules provide for the pass through of costs and savings arising from insurance, service standard, tax change, terrorism and network (grid) support events.

This contrasts to the AER's Position Paper on Pass-Throughs and Revenue-Cap Re-opens (December 2005). The paper refers to the objectives set out in the Rules (including incentive regulation and the commercial viability of the transmission industry) and identifies criteria for including a pass through event in a revenue cap (for example, the event should be beyond the control of the TNSP). Whilst the paper sets out a pro forma pass through mechanism, each revenue cap application is considered on a case-by-case basis.

The "one-size-fits-all" approach taken in the draft Rules does not provide the AER with the flexibility to respond to the individual or changing circumstances of TNSPs.

Further, the AER only recently developed and applied the pass-through provisions now being adopted by the AEMC. As such, it is premature to assess whether or not further improvements can be made. Locking the provisions into the Rules makes adjustments more difficult should they prove necessary. However, after sufficient experience it may be possible to lock these provisions into the Rules. Accordingly the AER recommends that the Rules provide for the AER to prescribe in guidelines the pass through events (or additional pass through events) for the purpose of clause 6.2.14.

It is recommended that the AEMC require the AER to prescribe in guidelines the pass through events for the purpose of clause 6.2.14. The definition of "pass through event" would need to be amended accordingly.

Positive Change Event: Assessment Period

The current pro forma AER pass through mechanism requires the AER to assess a pass through application within two months although this can be extended to four months. This approach provides flexibility in cases where further time is required (for example, where further information has been requested).

Clause 6.2.14(e) will require the AER, with respect to Positive Change Events, to make a decision within 60 business days.

It is recommended that clause 6.2.14 include a 'stop the clock' mechanism where information has been requested under clause 6.19(d) or parties are consulted under clause 6.2.14(i).

Negotiated Transmission Services (6.10)

- The AEMC has proposed a new negotiating framework to apply to transmission services.
- The AER considers that there is a risk that the boundaries between prescribed services and negotiated transmission services may be excessively subjective and left to the discretion of individual network businesses.

The new negotiated transmission service provision is based on the premise set out in the definition of the term *negotiated transmission service* that a network service can either exceed, or be less than, a predetermined standard. The AER also notes that in negotiating a service the price of any premium or discount is to be based on the differential between the actual cost incurred and the baseline cost of the reference level of the particular service.

The analysis in the following paragraphs suggests The weakness of the proposal as drafted is that the negotiated transmission service provision introduces significant complexity and possibility for regulatory gaming. Accordingly, the AER considers that there is a threshold question of whether the new negotiated transmission service provision delivers benefits that are sufficient to outweigh what appear to be significant costs. The comments below, however, are based on the provision as drafted.

The weakness of the proposal as drafted is it relies on there being readily identifiable and commonly agreed reference levels of service. For many of the potential services that may be subject to this provision the pre-determined reference standards are inappropriate or non-existent, and thereby this provision may be prone to misapplication. In practice it may be found that no meaningful distinction is possible between the intended reference service level and the negotiated transmission service in many circumstances.

Historically, only a small portion of a TNSP's assets have been devoted to negotiated transmission services for customer load or generation sources. The AER understands that less than 1% of TNSPs' assets are currently related to the provision of negotiated services between distributors and transmission businesses. Whilst network users other than customers have strong incentives to robustly negotiate their connection costs distribution businesses do not face the same incentive. Connection costs validly incurred by a distributor will be passed on to customers and thus the incentive to negotiate robustly is significantly weaker than for other categories of network user. This may result in higher costs in the long-term to end-users of the network, contrary to the market objective.

It is recommended that the status quo be maintained and any changes to the existing negotiable transmission services framework be principally directed to balancing the needs of network users with appropriate commercial incentives.

The attached report by Anthony Seipolt of Farrier Swier Consulting,⁴² analyses issues associated with implementing the proposed framework.

⁴² Farrier Swier Consulting, *Technical Review, Proposed NER Changes- Chapter 6 Review*, March 2006.

The report concludes that:

- The current processes for reviewing and auditing the allocation of shared service and directly incurred expenditures are insufficient to meet the requirements of the proposed negotiated transmission service framework.
- The proposed negotiated transmission service Rules will create a framework where the misallocation of expenditures (deliberate or not) between prescribed and negotiated transmission services would be very difficult to detect.
- The proposed negotiated transmission service framework is not clear on the type of network performance criteria that could be utilised for establishing negotiated transmission services.
- The proposed negotiated transmission service Rules will create greater opportunities for the manipulation of the proposed efficiency benefit sharing scheme.
- The selective application of negotiated transmission services could allow TNSPs to selectively isolate assets that provide increased returns, while receiving regulated returns for assets that remain in the RAB.
- The proposed negotiated transmission service Rules do not adequately describe the process for third-party access to negotiated transmission service assets and potentially allow for the exclusion of access to the negotiated transmission service assets.
- The termination process for negotiated transmission services appears not to have been considered in the draft Rules and potentially allows for the selective transfer of non-profitable assets back into the regulated asset base.

Based on the above findings, Farrier Swier conclude that the proposed changes relating to negotiated transmission service would not operate effectively within the current regulatory framework.

Furthermore, Farrier Swier found that significant additional regulatory oversight and expenditure would be required to enable the implementation of these rule changes in a satisfactory manner. This means that an important issue for the AER in future will be having an adequate information base and sufficient audit powers to be able to ascertain that assets have been correctly allocated into their correct categories.

The AER considers that its current information gathering and audit powers are not sufficient to minimise the potential for abuse and/or inefficient misallocations. This concern extends to directly incurred expenditures and the scope for manipulation of efficiency benefit sharing schemes. By selective application of negotiated transmission services it may also be possible for TNSP's to selectively isolate assets that provide increased returns, whilst receiving regulated returns for (less attractive) assets that remain in the regulated asset base.

Should the AEMC decide to proceed with proposed negotiated services framework, **it is recommended that** the information gathering and audit powers of the AER be strengthened to address any scope for gaming or misallocation of assets to the detriment of network users.

Another issue that may arise with this proposed framework is the uncertainty around the means by which assets provided for negotiable transmission services may subsequently move into a shared access category. The draft Rules are also unclear as to the termination arrangements that would apply in situations where an asset ceases to be part of a negotiated transmission service. As both of these issues affect the RAB, it is appropriate to consider strengthening the draft Rules or providing discretion to the AER to resolve these issues.

Should the AEMC decide to proceed with proposed negotiated services framework, **it is recommended that** the AER be given discretion to determine the process for conversion of assets providing negotiated transmission services to prescribed services.

A major technical weakness in the draft Rules lies in its reference to schedule 5.1. Schedule 5.1 provides reference levels of service that are largely intended to describe essential technical qualities that make electricity a homogeneous product and therefore permit common carriage. For a number of the technical qualities described in schedule 5.1 allowing deviations from the levels negotiated under schedule 5.1 runs a risk of causing harm to other network users or to system security.

Schedule 5.1 does not describe in any detail a number of parameters likely to be the subject of negotiation including power transfer capability, reactive power capability, firmness of supply or the degree of backup reliability available. Rather, it sets boundaries on the range of negotiation a network service provider may accept for a number of highly technical parameters strongly associated with the quality of supply and/or system security.

The schedule must be read in conjunction with clause 5.3.4A and the applicable schedule for the connecting party, be it a generator, customer or another network service provider. This framework bestows a right on a party to connect at the lowest level that does not impose a risk to system security nor adversely affect other network users. To the extent a network user seeks to connect plant that produces impacts on other users greater than that permitted under the process set out by clause 5.3.4A, the cost of any mitigation works necessary to address that possibility is already to the account of the network user.

The draft Rules appear to apply the provisions of clause 5.3 which contain explicit requirements to protect system security and the quality of supply to other network users (see, for example, clause 5.3.4A(a)). It is essential that this framework not be allowed to circumvent the preceding principles. The drafting suggests that the negotiating framework must not be inconsistent *inter alia* with the requirements of clause 5.3. This may be misinterpreted to not include the explicit requirements to protect system security and quality of supply.

Should the AEMC decide to proceed with proposed negotiated services framework, **it is recommended that:**

- explicit negotiable parameters be cited in the definition of prescribed services in substitution for schedule 5.1; and
- the drafting be amended to require that in any negotiation conducted under clause 6.10 that the principles set out in clause 5.1.3(b1) must also be applied.

Negotiating framework for negotiated transmission services (6.10.4)

- The AER is concerned that it is not clear whether the existing confidentiality requirements in clause 8.6 apply to the new confidentiality arrangements in this clause.

Clause 6.10.4(d) sets out arrangements for the treatment of confidential information. As this term is not italicised in the draft Rules, it may not fall under the existing definition of “confidential information” in Chapter 10 of the Rules. This would mean that existing requirements in clause 8.6 of the Rules for such confidential information may not apply.

The AER considers that there is no policy reason to develop a discrete, separate confidentiality regime for TNSPs when an effective regime is already in place. If it is intended that this provision should be subject to a separate confidentiality regime the AEMC should provide the rationale behind this decision.

Also, given the significant additional regulatory oversight and expenditure that will be required to enable the satisfactory implementation of this proposed framework for negotiated transmission services, the issue of confidential information will be very important. The AER believes that the Rules should allow the AER the necessary access to relevant information to do its regulatory job. Hence, the AEMC needs to ensure the dispute resolution arrangements that apply to negotiated services do not lead to divergent frameworks for the management of confidential information.

It is recommended that the term “confidential information” throughout Chapter 6 be made subject to the Chapter 10 definition to prevent the emergence of divergent frameworks for managing confidential information.

Commercial arbitration for negotiated transmission services (6.10.5)

- The AER is concerned that two different dispute resolution processes will apply to different types of transmission-related disputes. The dispute resolution process set out in Chapter 8 of the Rules will continue to apply to disputes referred to in clause 8.2.1(a)(4), whereas a commercial arbitration regime will apply to disputes involving negotiated transmission services.
- The AER submits that it may be preferable that the same dispute resolution arrangements apply to disputes covered by clause 8.2.1(a)(4) and disputes involving negotiated transmission services.

The AER notes the proposed arrangements for dispute resolution of disputes relating to negotiated transmission services. Under these arrangements, commercial arbitration (rather than the Chapter 8 Rules dispute resolution process) would be used to resolve disputes relating to negotiated transmission services.

The AER notes the AEMC's statement that the current dispute resolution provisions under Chapter 8 of the Rules are not well suited to the resolution of disputes in relation to the pricing of services arising from commercial negotiations. However, it is not clear that the clause 6.10.5 dispute resolution framework for negotiated transmission services will always ensure a streamlined dispute resolution process, as under clause 8.2.1(a)(4) of the Rules, the Chapter 8 dispute resolution framework will continue to be used for certain connection-related disputes. Disputes involving non-price issues may also involve pricing issues. For that reason, disputes involving negotiated transmission services should be consolidated under the same dispute resolution framework as disputes covered by clause 8.2.1(a)(4).

The AER considers that the arbitration arrangements which apply to disputes arising under the National Gas Code are a better model for a consolidated dispute resolution regime for disputes involving electricity transmission services.

It is recommended that disputes involving negotiated transmission services and disputes currently covered by clause 8.2.1(a)(4) should be consolidated under the same dispute resolution framework. The dispute resolution regime should be based on the dispute resolution regime set out in the National Gas Code.

Revenue Proposal and proposed negotiating framework (6.12)

- The AER considers that the propose-respond process codified in the draft Rules is inappropriate for electricity transmission revenue regulation.
- The AER considers that the Rules should prescribe only high level issues such as the overall timeframe for a decision and the latest time at which a revenue determination should be delivered, with the details of the regulatory decision making process contained in binding AER guidelines.

The draft Rules codify the procedures for a “propose-respond” model, which outlines in detail the regulatory decision-making processes of the regulator. The AER believes that the process codified in the draft Rules is inappropriate for electricity transmission revenue regulation. As outlined in Part A of this submission, the AER is concerned that a propose –respond model:

- *works against achieving greater consistency in regulatory approach:* While the information to be provided in support of the Revenue Proposal is extensive, the draft Rules leave it to the TNSP to determine the basis upon which capex and opex is to be forecast. This is reflected in clauses 6.9.1(b) and 6.9.2(b), which require a TNSP to describe the methodology used to arrive at the forecasts. This means that there is a significant risk of a proliferation of different approaches for dealing with the same issue and that approaches may vary between TNSPs and between resets for each TNSP.
- *may encourage regulatory gaming:* Under the propose-respond model outlined, where doubt exists as to a value the regulator must err on the side of the service provider. This may encourage service providers to submit proposals that overestimate capex and opex requirements. Also, the AER believes that gaming is further encouraged in the draft Rules as the service provider has the ability to submit a revised revenue proposal after the draft determination. This issue is discussed further in the section dealing with clause 6.15.3.
- *provides for an upward bias in returns to regulated companies:* As acknowledged in the Draft Report of the Expert Panel, the propose-respond model would be likely to lead to a systematic increase in the returns to regulated entities.⁴³ The Expert Panel’s comments are a more general comment on the propose-respond model, rather than explicitly addressing the AEMC’s proposed model. Nevertheless, the AEMC’s proposals are a change from current practice and risk higher prices.

The AEMC has not explained what it sees as the problems with the current approach or how the new provisions would address the identified problems. Given the problems identified with the AEMC’s proposals, the AER recommends that the AEMC adopt the “consider-decide” model proposed by the Expert Panel.

Aside from these significant issues related to the propose-respond model outlined in the draft Rules, there are a number of other issues concerning the decision making processes.

⁴³ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, page 68.

In relation to timeframes for regulatory decision making, the AER notes that clause 6.12.1(a)(1) requires a revenue proposal to be submitted 13 months before the end of a regulatory period, with a final decision to be issued within 11 months from that submission date. This timeframe is not substantially different to the 12 month process set out in the SRP.

The AER believes that it is appropriate for the Rules to set high level guidance on the decision making process, such as the overall timeframe for decision making and requiring the AER to issue a draft decision and consult on its draft decision before issuing a final decision.

However, the AER notes that the AEMC draft Rules also prescribe precise details and deadlines for each step in the decision-making process. The AER considers that this may not provide the flexibility necessary to respond to issues as they arise during the regulatory decision making process which could compromise the quality of regulatory decisions. The AER recommends that the Rules require the AER to develop process guidelines consistent with high level guidance set out in the Rules. The AER will also be required to ensure such guidelines meet the requirement of section 16(1)(b) of the NEL.

Further, the AER notes that the draft Rules do not address the issue of compliance measures such as ‘stop the clock’ provisions. This means that in the event that a TNSP refuses to follow or meet their obligations and deadlines under the proposed regulatory processes, there are no measures provided in the draft Rules to ensure the process and timeframes are not compromised. This issue is discussed further in relation to draft clause 6.13 below.

It is recommended that the AEMC:

- move away from the propose-respond model based on reasonable estimates of capex and opex outlined in the draft Rules.
- require the AER, in making a draft or final determination in relation to revenue/prices, to have regard to the regulated entity’s proposal, any relevant submissions made, and any other relevant information and analysis.

In relation to the AER’s revenue reset process **it is recommended that** the Rules should:

- set an overall 12 month timeframe for the regulatory reset process and a requirement for the AER to consult and issue draft and final decisions.
- require the AER to issue guidelines on the details of a regulatory process.
- include stop-the-clock provisions to deal with TNSP non-compliance with guidelines.

Guidelines (6.12.2)

- The draft Rules provide a list of guidelines which must be issued by the AER within 6 months of the Rules taking force. However, some of these deadlines may need to be extended to take account of on-going work programs in relation to cost allocation and the service performance target incentive scheme.

The AER notes that it is to issue the following guidelines and models within 6 months of the Rules taking force:

- Information Guideline
- Cost Allocation Guideline
- Service Performance Target Incentive Scheme
- Efficiency Benefit Sharing Scheme
- Post Tax Revenue Model
- Roll-Forward of Regulatory Asset Base Model

The AER supports the proposal to require the AER to develop the guidelines listed. The AER also considers that the methodology by which TNSPs forecast capex and opex, the regulatory decision making process, WACC parameters, pass-through events and the capital expenditure incentive mechanism should also lie in AER guidelines and not the Rules. These aspects of the regulatory framework are discussed at various points in earlier parts of this submission.

Given the minimum 3 month consultation process set out in the draft transmission guideline procedures (clause 6.22 of the draft Rules), it will be a significant challenge for the AER to produce the six guidelines required by 31 December 2006. The AER recommends the AEMC provide flexibility in the Rules to extend this deadline if it becomes necessary. This is particularly the case in relation to issuing a Service Performance Target Incentive Scheme (for the reasons discussed earlier in the submission) and Cost Allocation Guidelines.

Clause 6.21(b) requires the AER to issue Cost Allocation Guidelines within 6 months of the Rules taking force. The AER considers that the Rules should provide some flexibility to extend the deadline given that developing sound Cost Allocation Guidelines is contingent on quality ring-fencing guidelines being settled first. The AER notes that a working group is currently examining issues related to prescribed and non-prescribed services and its work will naturally inform the ring-fencing guidelines. Given that the draft Rules have adjusted the boundaries between prescribed services and negotiated transmission services, the AER believes this ring-fencing work will need to be completed before cost allocation may be examined.

The AER also notes that it would be preferable to allow the AER to make minor amendments to the guidelines without having to follow the process set out in the transmission guideline procedures.

It is recommended that:

- clause 6.12.2 be amended to extend the date for the completion of the service target performance incentive scheme guideline to 31 December 2007.
- clause 6.21(b) be amended to extend the date for the completion of the cost allocation guideline to 30 June 2007.
- a provision be inserted into the Rules to allow the AER to make minor amendments to its guidelines without having to follow the process set out in the transmission guideline procedures.

Preliminary examination of Revenue Proposal, proposed negotiating framework and required information (6.13)

- Clause 6.13(c) of the draft Rules provides that where the AER believes a TNSP's initial Revenue Proposal does not comply with the applicable guidelines, the TNSP must resubmit a proposal that is compliant.
- However, the AER notes that the current draft Rules do not explicitly limit the TNSP to only revising its Revenue Proposal to make it comply with the Guidelines nor provide any measure to address cases of non-compliance.

Clause 6.13(c) of the draft Rules provides that where the AER believes a TNSP's initial Revenue Proposal does not comply with the applicable guidelines, the TNSP must resubmit its proposal so that it complies.

However, the draft Rules do not explicitly limit the TNSP to only revising its Revenue Proposal to address the AER's compliance concerns, but is drafted in such a way that could result in the TNSP submitting a completely different Revenue Proposal. The AER considers that the TNSP should not be able to substantially change its Revenue Proposal in this way and the Rules should minimise any opportunity to game the process. The clause should therefore explicitly state that any revision to the Revenue Proposal should be limited to changes necessary to address the AER's concerns in relation to the proposal's compliance with the guidelines.

In the context of timeframes applying to regulatory decision making, the AER considers that clause 6.13(c) should be accompanied by a stop-the-clock provision to be used in situations where the TNSP's Revenue Proposal does not comply with the requirements of the guidelines. The AER notes generally that stop-the-clock provisions are undesirable as they tend to foster adversarial attitudes between the Regulator and the regulated business. However the AER considers them necessary to ensure that regulatory deadlines associated with the propose-respond model proposed in the draft Rules can be met. The Expert Panel expressed the view that 'the inclusion of fixed time limits necessitates the creation of 'stop-clock' mechanisms that can be complex and distracting.'⁴⁴ The AER shares this view, and believes this supports the AER's proposal that it be able to issue guidelines on the revenue cap process. However, if these timeframes are to be prescribed in the Rules, a stop the clock provision is critical.

It is recommended that in the event that the propose-respond process in the draft Rules is adopted:

- Clause 6.13 be revised to limit any revision to the Revenue Proposal to changes which address the AER's stated concerns about the Proposal's non-compliance with the Guidelines.
- Clause 6.13 include a stop the clock provision.

⁴⁴ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, page 64.

Revised Revenue Proposal or proposed negotiating framework (6.15.3)

- The AER considers that it is inappropriate to allow a TNSP to resubmit a revised Revenue Proposal or Negotiating Framework following the Draft Decision as it may create an opportunity for regulatory gaming.
- The AER considers that 6.15.3(a) should be deleted.

The draft Rules require that the AER must consider a TNSP's revised proposal in place of the first (or if they resubmitted prior to draft decision stage, second) revenue proposal if one is submitted under clause 6.15.3(a). The AER considers that allowing TNSPs the ability to resubmit in this fashion has the potential to create an opportunity for regulatory gaming. It is also likely to result in significant additional regulatory cost for all market participants and indeed may render the consultation process up to that time irrelevant.

This understanding is consistent with the findings of the Expert Panel Report which notes that:

“...by allowing the ‘presumption’ of approval not just to apply to the initial consideration by the AER of whether a proposal is acceptable, but requiring it also to be applied in considering the regulated entity’s amended proposal lodged after the release of the draft determination, the AEMC approach does not provide any incentive to reduce regulatory game playing by entities lodging proposals.

Indeed the regulated entity has an incentive to make an ambit claim at the commencement of the process in order to discover whether it lies above the regulator’s estimate of a reasonable range, and if it does, to flush a counter proposal out from the regulator in the form of a draft determination. Under the Gas Code and under the AEMC’s draft Rules, this search process is at no bargaining cost to the regulated entity as it retains a capacity to make a final offer in response to the draft determination. Under the current interpretation of the Gas Code (and presumably the same would apply to the AEMC draft Rules), the regulator must accept such an offer if it lies within the regulator’s estimate of a reasonable range. The final offer will not of course be less than that proposed by the regulator.”⁴⁵

The AER therefore considers that this ability for the TNSP to submit a revised proposal should be removed.

It is recommended that clause 6.15.3 be deleted.

⁴⁵ Expert Panel on Energy Access Pricing, *Draft Report to the Ministerial Council on Energy*, pages 76.

Information disclosure by TNSPs and the AER (6.19 and 6.20)

- The draft Rules do not address the anomaly regarding the publication by the AER of an annual report on the financial and economic, as well as operational, performance of transmission networks.
- The AER considers that the draft Rules should be amended to allow the AER to undertake this publication function.

The AER intends to publish an annual report containing information on each TNSP's network characteristics; financial indicators (eg return on assets); operating ratios (eg opex/line length); service standards performance; and comparisons between actual outcomes and revenue cap components. The AER also intends to publish more general reports reviewing the operation of the national electricity market and regulation of transmission networks.

The AER considers that such reports facilitate informed public input into future decisions by the AER, AEMC and other bodies; provide greater transparency and accountability of the regulatory process; recognise the interrelationship between revenue and the standard of service; and foster efficient outcomes by allowing comparisons to be made between TNSPs. Such reports are routinely published by the State and overseas regulators, and are regarded as good regulatory practice.

However, the two electricity regulatory reports issued to date by the ACCC (2002/2003 and 2003/2004) cover only the TNSPs that consented to publication, and exclude the TNSP that did not consent.

Clause 6.2.5 of the Rules (like the proposed clause 6.19) requires TNSPs to provide to the AER on an annual basis information on the TNSP's financial and operational performance. The AER is not able to disclose the information provided without the TNSP's written consent, or, if consent is declined, giving the TNSP a formal notice under clause 6.2.6. Clause 6.2.6 (like the proposed clause 6.20) allows the AER, in discharging its functions under the Rules, to release information subject to certain conditions.

Whilst the Rules expressly provide for the AER to publish an annual report on TNSPs' performance against service standards, there is no equivalent provision expressly providing for the AER to publish reports such as an annual report reviewing TNSPs' financial and economic performance. After obtaining legal advice, the ACCC formed the view that it could not issue a notice under clause 6.2.6 to a TNSP who had refused consent to the inclusion of information in the regulatory report (except in relation to service standards). This remains an issue under the draft Rules.

The recommendation below reflects the wording of clause 9.1(a) of the Australian Energy Market Agreement (30 June 2004) and the reference to 'national electricity market' in section 2 of the NEL.

It is recommended that clause 6.19 be revised to provide that:

- (a) a function of the AER is the collection, analysis and dissemination of information on matters relating to the economic regulation of the electricity market and transmission networks; and
- (b) the certified annual financial statements submitted by TNSPs under clause 6.19(a) must include such information as the AER may reasonably require to perform this function, and may be used by the AER to perform this function.

Chapter 11 – Savings and Transitional Rules

- The savings and transitional arrangements provide for the re-opener provisions to apply to existing determinations.
- The AER considers that it is inappropriate for determinations that were made “on-balance” to be fundamentally altered in this way.

Clause 1 of the proposed Chapter 11 appropriately seeks to protect determinations that were made by the ACCC/AER before 1 July 2006. However, the AEMC has proposed applying the re-opener provision (clause 6.2.12) to pre-existing determinations that were made before this date.

The AER has argued that this re-opener provision should be removed. Even if it is not, the AER submits that it is not appropriate to amend the balance of existing determinations by applying the re-opener provision. The determinations in effect today have been made under the Code and the principles set out in the DRP and the SRP. Allowances for forecast capex have been determined on the basis of a probabilistic assessment of *all* capex requirements and, in the case of NSW, the ability to separately fund contingent projects. Had a capex re-opener provision existed at the time these decisions were made, they would have been substantially different. Changing the underlying framework by introducing a capex re-opener fundamentally changes the regulatory compact that underpins these revenue cap determinations.

It is recommended that the AEMC amend the proposed transitional and savings arrangements by removing clause 2, to ensure that the regulatory compact that underpins existing determinations is preserved.

Part C



**Providing certainty through codification:
comments on the AEMC Rule Proposal**

A report by

Firecone Ventures Pty Ltd

March 2006

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1 Introduction

The AEMC Rule Proposal Report says that the AEMC's aim is:

“Increasing clarity, certainty and transparency of economic regulation so as to provide a more certain regulatory environment for efficient long-term investment”

The AEMC aims to achieve this through increased codification in the Rules of procedures and methodologies to be used in the regulation of transmission revenues.

This report considers the merits of increasing clarity, certainty and transparency through increased codification. It starts by considering in greater detail what is meant by these terms. It then briefly summarises the AEMC approach.

We then assess the policy rationale, effectiveness, and efficiency of codification, compared with other ways of addressing similar objectives.

Our conclusion is that the policy rationale for a marked increase in codification is unclear. The AEMC has indicated that there is a heated debate on economic regulation. It has proposed major changes to the Rules for economic regulation of electricity transmission. However, it does not discuss the nature of the heated debate, its position on that debate, or how this relates to the changes it has proposed. Transparency would be assisted by a clearer linkage of the AEMC proposals to a desired policy outcome.

The AEMC's proposed rule changes will lead to a substantial increase in codification. Some increase in codification may be desirable: for example, of key inputs to the WACC. However, the regulatory task cannot be fully codified. It is not desirable or feasible to reduce complex commercial tasks such as the conduct of economic regulation to a set of binding rules. The attempt to do so is likely to reduce rather than increase certainty.

It remains desirable to ensure that regulated businesses can understand with reasonable certainty how economic regulation will be conducted. The instruments available for that purpose include the use of principles, rules and guidelines; the governance framework for the regulator; and requirements on the conduct of regulation, including appeal mechanisms. Relying on rules alone to provide certainty will be ineffective.

2 Key Concepts

2.1 *Clarity, certainty and transparency*

The AEMC rule proposal report makes frequent reference to clarity, certainty and transparency. A useful starting point is the meaning of these terms.

We take clarity and transparency as being similar. Both require that the rules for the economic regulation of electricity transmission are clear, and likely to be understood in the same way by all parties. Transparency further requires not simply that the rules are clear, but also that the rationale for the rule is clear.

The UK's Better Regulation Task Force report provides a number of characteristics to achieve transparency. These include:

“Policy objectives, including the need for regulation, should be clearly defined and effectively communicated to all interested parties.”

This interpretation appears very consistent with the desire in Australia to achieve policy transparency through the establishment of the new regulatory architecture.

The distinction between clarity and transparency can be illustrated by an example from the rule proposal. The decision that the cost of capital should assume a triple BBB credit rating is clear. The discussion of the rationale for that decision (that undue weight was previously given to Government ownership in analysing the costs of debt) assists with transparency.

The term ‘certainty’ is more problematic. A possible interpretation of this term is that outcomes are certain: that is, that a TNSP can know with absolute certainty what its regulated revenues will be under all possible scenarios. That would require that the regulatory task can be defined in such detail that it becomes a simple processing of inputs, through a process defined in sufficient detail that other parties can undertake it themselves, and so determine the outcome.

A more realistic interpretation may be that the AEMC is seeking to make regulatory outcomes more predictable. This seems consistent with the focus on ensuring a good environment for investment. That will be assisted if investors can predict with reasonable accuracy – but not with absolute certainty - what their revenues will be under a range of different future states.

2.2 Codification

The AEMC is seeking to provide certainty by a higher level of codification. They state¹:

“The Commission also believes that increased codification in the Rules of the procedures and methodologies to be applied provides greater regulatory certainty for TNSPs, other market participants and the AER itself.”

This in turn raises the question of what is meant by codification. This appears to mean a greater reliance on rules, rather than standards or principles. The distinction is an important one to understand the approach being taken by the AEMC, and its weaknesses.

A rule is applicable in an ‘all-or-nothing’ fashion. If a particular state of the world applies, the rule is applicable. Its applicability is mandatory, and not subject to discretion. If the rule is applicable, then it requires a defined outcome. If it is not applicable, it does not.

By contrast, a principle sets out a reason that argues in one direction. However, this may need to be weighed up against other principles, which may argue in other directions².

¹ Transmission Revenue: Rule Proposal Report, page 10

² We note that the AEMC uses the term differently in some cases. For example, the Rule Proposal Report states on page 53 that the principles for calculating the parameters of the revenue cap are to be included in the rules and will be binding. We find this a confusing use of the term. Stating that the equity beta must be one is best described as a rule, not a principle.

The implication of this is that rules cannot conflict, provided the rules are well designed. A rule is either valid or not, and if it is valid this leads to a certain outcome. By contrast, principles can conflict. When principles do conflict, decision makers need to assign weights to different principles to resolve those conflicts. This assigning of weights, and trading-off between principles, introduces the exercise of discretion by decision makers.

It follows that a rule creates greater certainty than a principle – at least for a narrowly defined outcome. For example, a rule that the cost of debt in the development of the WACC should be based on a BBB credit rating has a more certain outcome than a principle that the WACC will be based on parameters set with reference to other companies with similar characteristics. However, as we discuss further below, this does not demonstrate that certainty for complex commercial processes – such as economic regulation – is best achieved through reliance on the iterative use of rules.

3 The AEMC Approach

The AEMC is seeking to provide a more comprehensive set of rules. The AEMC consider that a rule-based approach to energy regulation is consistent with the separation between the AEMC and the AER in making and implementing rules, and with a more certain environment for long term investment in transmission.

It is also seeking to reduce the use of discretionary principles. Key elements of the AER's Statement of Regulatory Principles (SRP) have been included within the proposed Rules. The AEMC also points out that there are currently competing objectives and principles in the Rules; that the SRP is not binding; and the AER has discretion in determining how competing principles are to be reconciled.

The AEMC proposals would create greater certainty on the use of revenue caps, for a period of five years (if proposed by the TNSP), based on a building block approach. They reduce this certainty through introducing a new stranding risk and scope to reopen revenue caps under defined circumstances.

The main change in the AEMC's approach has been to codify (that is, include within the National Electricity Rules) processes, methodologies and assumptions for regulatory decision making. This appears intended to deliver increased certainty on the regulatory outcome in future periods.

It is challenging to establish binding rules for complex decisions, with major economic effects, and dependent on future information. The AEMC has attempted to do so by:

- Codifying inputs: the AEMC incorporates within the Rules particular parameters to be used in setting the cost of capital
- Codifying processes for decision making. This includes:
 - Codifying the information to be sought, through requiring the AEMC to publish guidelines on the information required in revenue proposals, and specifying in the rules what must be covered in those guidelines; and
 - Codifying processes for review: the AEMC establishes an obligation to accept the TNSP's forecast capital expenditure if it is a reasonable estimate,

and defines what factors should be taken into account in considering whether a forecast is a reasonable estimate

- Codifying timelines: the AEMC defines the steps in the regulatory decision making process, and establishes maximum timelines for each step.

Our understanding is therefore that the AEMC is seeking to achieve greater predictability of future regulatory outcomes, through a higher reliance on codification, and the use of prescriptive rules, and a lower reliance on the exercise of discretionary decision making guided by less prescriptive principles.

In most processes there is a balance between clear, binding rules and other instruments. An important question is therefore to what extent the AEMC is seeking to rely on binding rules. The AEMC indicates that its proposed rule contains a ‘complete methodology’ for making a revenue cap determination. It is unclear what is meant by this term. The AEMC has certainly introduced much more detail. However, the methodology is not complete (in the sense that it is clear how it operates under all future states of the world). In addition, it is not feasible that it could be complete.

4 Policy rationale

4.1 *Transparent Policy Objectives*

The AEMC has adopted an approach which seeks to substantially reduce AER discretion, and to codify processes for its decision making. This increases the importance of transparency in the AEMC’s decision making. An increased level of codification means the key decisions are reflected in the Rules, rather than in their interpretation and application.

The AEMC may only make a Rule if it is satisfied that the Rule will or is likely to contribute to the achievement of the national electricity market objective:

“The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.”

It may seem self-evident that clarity, certainty and transparency assist the NEM objective – and it does seem hard to argue for lack of clarity, uncertainty and non-transparency. However, the approach being taken by the AEMC has both costs and benefits, when assessed against the NEM objective. It is desirable that its rationale for a marked increase in codification is set out in a transparent manner.

The AEMC Rule Proposal Report indicates that there is an intense public debate on the impact of economic regulation on infrastructure investment. Policy transparency would suggest that the AEMC should provide some guidance on its conclusions from that debate, and the way in which its policy conclusions are reflected in the rules.

The Rule Proposal will have a significant impact on the incentives for transmission investments. Changes which affect the expected value of returns include:

- *Change in the approach to cost estimates:* the AER is obliged to accept the TNSP's forecasts of capital and operating costs unless it can show they are unreasonable.
- *A new stranding risk:* the rule introduces a new stranding risk. The identification of stranding in an interconnected transmission network, with N-1 security, will be complex. As the rule gives no clarity on how that will be undertaken, it is hard to assess the impact;
- *Reopening:* the rule introduces a obligation to re-open the price cap when the TNSP exceeds the target allowance by a defined margin. It is hard to assess the impact of this, as the drafting of the rule is unclear, but it appears to give very significant protection against downside risk;
- *Cost risk sharing,* the draft rule proposes new pass-through mechanisms; and
- *Incentives:* the draft rule introduces changes in the incentive framework.

In addition, the draft rule would codify a number of parameters for the setting of the WACC for a five year period. These are largely consistent with earlier decisions by the ACCC, but allow for a higher cost of debt.

Our impression is that the combination of these factors will increase the incentives for transmission investment. However, that is simply a guess. Understanding the impact would require modelling of all the variables described above, and no doubt others. Even rigorous modelling could result in differences of opinion, since capable modellers can reasonably disagree on the treatment of 'softer' risks, such as the likelihood of asset stranding.

Our point is not the impact that these changes will have. No doubt the AER will model the impact and where necessary raise it with the AEMC. Rather, our point is that there is no alternative to the reader to guessing what the impact may be. The AEMC introduces what look like significant changes, but their Report does not analyse the impact these changes will have on the returns to transmission investment.

They also do not indicate what problem they are addressing. For example, they do not say that there is evidence of under-investment in transmission. Nor do they say that there is evidence of over-pricing and excessive returns.

The AEMC does refer a number of times to 'the perception of regulatory risk'. However, it makes no attempt to discuss whether it considers that perception is correct. Perceptions seem less important than outcomes. The AEMC makes no attempt to assess the adequacy (or otherwise) of transmission investment.

As a result, the level of policy transparency is low. Essentially, the AEMC has different views from the AER on a number of issues of regulatory design, and has placed more weight on its views. We set out below what appear to be the costs and benefits lying behind their decision.

4.2 Benefits of increased codification

Transmission requires major, long lived investments. Investors are well placed to manage the risks associated with capital and operating costs. They also need to be able to predict with reasonable accuracy what revenues they will realise from transmission investments. As the investments are long-lived, that requires an ability to assess likely revenues over future regulatory periods, as well as within the current period.

The AEMC consider that their approach will improve the environment for investment by increasing regulatory clarity and certainty through the Rules. The benefits are presumably the dynamic efficiency gains from a more certain investment regime.

The main innovation is the attempt to reduce uncertainty over future regulatory determinations, through requiring the AER to accept reasonable estimates of future capital expenditure, and more generally through codification of the process, methods and assumptions for revenue cap determination.

Our impression is that this increases the likelihood that TNSP proposals will be accepted, by shifting the burden of proof, limited the AER's discretion in assessing prudent capital expenditure, and imposing timelines. That would be a useful step if there was evidence that:

- The regulator was consistently making errors, and rejecting proposed capital expenditure which was indeed efficient when setting revenue caps, or
- The TNSPs perceived the risk of this happening as high, and so were reluctant to propose capital expenditure.

There is nothing in the Rule Proposal Report to support either of these hypotheses.

The second impact on certainty will be to lock in parameters used in the WACC. This reduces the risk of a regulatory decision to alter those parameters and lower returns on sunk investments. It does so for – at most – an additional five year period, as the AER is required to review the parameter values by 2011.

This increase in certainty on future returns is offset by introducing a new risk of ex-post optimisation.

The third major change in certainty is to introduce scope to reopen revenue caps under defined outcomes. This may be a good process, and may be more effective than an attempt to develop a fuller contingent contract, which allowed for possible future projects. It may also reduce risk for TNSPs. However, it cannot be considered to increase certainty, in the way this term is used by the AEMC.

Our conclusion is that the AEMC appears to anticipate gains in dynamic efficiency from its proposals. This may be attributable to either a (modest) increase in certainty over the future WACC, or else a reduction in regulatory error through more prescribed processes for decision making.

4.3 Costs of Increased Codification

The costs of adopting a highly prescriptive, codified approach to future price determinations are the loss of flexibility on the part of the regulator, and the likely reduction in regulatory innovation. As the Better Regulation Taskforce notes “There is clear evidence that unexpected and unnecessarily frequent changes to regulatory arrangements can impose considerable costs on industry and ultimately consumers. Yet there is equally clear evidence that regulatory regimes need to be able to gradually adjust to changing circumstances”.

The evolution of regulation over time can help to diminish the overall risk experienced by the regulated businesses. It will of course still be possible to modify the Rules, and so to achieve regulatory innovation following consideration by the AEMC. As a result, it is hard to assess how material the cost of codification and prescription will be. At the least, the decision to codify processes, methods, formulae and assumptions to such an extent is likely to lead to high transaction costs and delays in achieving change to regulatory process. There could be a gain in transparency. However, as discussed above, the decision making processes in developing this new rule have not been transparent.

At worst, a high level of codification could lead to ossification: the regulatory processes could become effectively fixed because of the high cost of achieving change. As Box 1 discusses, the ACCC made a number of changes to its approach to transmission revenue regulation with the aim of reducing risk and increasing certainty of investment for TNSPs and users.

Box 1: Evolution of the ACCC Statement of Regulatory Principles

In 1999, the ACCC issued a Draft Statement of Principles for the Regulation of Transmission Revenue (DSRP). The objective of the SRP was to establish guidelines on how the ACCC will perform its regulatory function with respect to transmission revenues. The ACCC commenced a review of DSRP in 2003 and issued its draft decision on its SRP for TNSPs in August 2004. The final decision issued in December 2004 resulted in some significant changes from the DRSP which the ACCC determined were required to improve efficiency incentives. The AER has adopted these regulatory principles.

In developing the SRP, the ACCC stated that it had taken measures to increase certainty of investment for TNSPs and users. One of the key changes from the DSRP was the move to ex-ante investment regulation from the previous approach of ex-post assessment of asset optimisation. Under the previous approach, the ACCC retrospectively assessed the efficiency of TNSPs capital expenditure programme. The ex-post approach meant that an assessment of investment decisions occurred after the actual investment decision had been made by the TNSP. It also required an evaluation of the efficiency with which the assets were developed after they had been constructed.

The change to ex-ante enables the introduction of efficiency incentives through the establishment of investment targets and represented a significant change from the DRSP which provided for a firm cap. The effect of this was that TNSPs exceeded the cap they were unable to recover the excess from consumers. The ACCC found that the previous arrangement was problematic especially where the efficient expenditure requirement was higher than expected. This could result in the TNSPs not being fully compensated for efficient overspend.

Another significant change from the DSRP related to the valuation of sunk assets. In the DRSP, the approach to valuation of sunk assets was to periodically revalue assets on a depreciated optimised replacement cost basis (DORC). The ACCC found that periodic revaluation of assets can lead to significant variations in value due to the differences between replacement and historic cost. The flow on effect being it creates the risk that efficient expenditure may not be recoverable which will ultimately deter efficient investment. To address this, the ACCC changed the approach to roll forward the value of sunk assets at their depreciated historic cost taking account of inflation.

A further possible cost arises from the shift in the burden of proof. If the AER has to accept reasonable estimates of capital expenditure unless they fail to meet defined criteria, this may lead to capital expenditure – and costs to consumers – which would not have arisen under alternative approaches to regulatory review.

5 Effectiveness of the AEMC approach

The discussion above has concluded that the AEMC is seeking an increased reliance on prescriptive rules, and a lower reliance on discretionary application of principles. The AEMC considers this will provide increased transparency, certainty and clarity, and that an increase in these characteristics of regulation will better meet the NEM objective.

We now turn to consideration of whether an increase in codification will be effective.

5.1 *Are the rules complete?*

The AEMC is seeking to include a complete methodology for determining a revenue cap within the rules. A first question is whether it has succeeded in that task.

The rule requires the use of particular *inputs*, for example the parameters to be used in setting the WACC. It is easy for all parties to monitor whether this rule has been observed. It is also straightforward to identify a response to breach of this rule. As an example, if the AER adopts a credit rating other than BBB, the TNSP can easily identify this as a breach of the rules, and require the substitution of whatever credit rating has been used by a BBB credit rating.

Regulatory decision making requires consideration and review. The AEMC attempts to codify the review *processes* by requiring the information sought to be defined and the review to be against defined criteria. It will be harder to assess whether this rule has been observed, due to the complexity of the processes that it covers.

As an example, the AER is required to accept the forecast capital expenditure if it is determined to be a reasonable estimate, taking into account factors such as the reasonableness of the demand forecasts, the relative prices of capital and operating inputs, actual and expected capital expenditure, and reasonable estimates of the benchmark capital expenditure.

The Rule lists a number of issues which any reasonable person would take into account when considering whether a forecast of capital expenditure is reasonable. However, this is a long way from delivering certainty:

- The terms are not defined. The meaning of a term such as ‘reasonable estimates of the benchmark capital expenditure’ is clearly critical, but open to many interpretations.
- No weightings are attached to the criteria in the Rules. Their impact could vary significantly. For example, if the AER attached a lot of weight to historic performance on actual versus expected capital expenditure, this could lead to very different conclusions from an approach which was simply forward looking.

- It is unclear whether the AER can take into account issues other than those set out.

As a result, this is a long way from being a ‘complete methodology’ the AEMC suggest it is.

The AEMC also seek to prescribe *timelines*. It may be more straightforward to assess whether or not these timelines have been met.³ However, the AER is subject to statutory obligations on the manner in which it performs its economic regulatory functions. This might lead it to conclude that it was not possible to meet the prescribed timelines and meet its statutory obligations. It is unclear what the response will be if the AER fails to meet the timelines.

It would of course be possible to construct a basis for enforcing these obligations. If the AER failed to meet a deadline – for example, it failed to hold a pre-determination conference within 5 to 15 business days – it could be subject to penalties. Those penalties could be calibrated to reflect the damage to transmission businesses from delay and uncertainty. To avoid any payment risk, the AER could be required to post a ‘timeline’ bond, to support its obligation to pay penalties. Alternatively – and perhaps more in line with the AEMC’s approach – the AER could be obliged to simply accept the TNSP proposal if the AER did not meet the timetable set out in the Rules.

Before anyone adopts this suggestion, we should point out that it is put up to illustrate how mistaken this thinking is. The processes described in the rule relate to the conduct of a complex commercial process, with major financial implications. Principals do often use third parties for complex tasks, such as renegotiating and repricing long term contracts. This has some similarities to the AEMC’s attempt to set the rules within which the AER will conduct the price determination. However, no-one would use a third party on terms such as this, for the simple reason that it would be highly ineffective.

Our conclusion is that the AEMC has not written a complete methodology for conducting a price determination. It has left significant uncertainty over how assessment processes will be conducted, and in many cases provided no information on what will happen if the rules are not observed. The next section considers whether it is desirable to seek to write a complete methodology.

5.2 Will completeness provide certainty?

A second question is whether the attempt to write complete rules will create certainty. The AEMC clearly believes it will. Not only do they stress that they have included a complete methodology within the rules. They also complain that the principles set out in the current rules are conflicting. The AEMC evidently believe that binding rules with deterministic outcomes deliver more certainty than the discretionary application of principles.

In practice there are significant problems with relying on prescriptive rules to provide certainty, for major and complex commercial arrangements (such as economic regulation) within a changing environment. The reasons for that are set out at length in the literature on transaction costs:

³ Although we note that this will not always be straightforward. It is unclear for example whether the clock continues, ‘stops ticking’ or is restarted if the AER concludes that the TNSP’s proposal does not comply with the AER’s guidelines.

- It is hard to think very far ahead, and to identify all the possible contingencies that might arise.
- Even if the parties concerned can identify possible future contingencies, it is hard for them to develop a common language to describe those future states, and the actions arising from them, and
- Even if the parties concerned can identify future states and identify the actions if they arise, it is difficult to write those plans down with sufficient clarity that – in the event of a dispute – an outside authority (such as a court or an arbitrator) can determine what was intended, and ensure it is enforced.

It is relatively straightforward to write a simple rule for inputs that apply to all states of the world. An example would be that WACC calculations should use a triple BBB credit rating in all states (at least for a defined period). However, it is impossible to extend this to more complex processes, and to write complex contingent contracts that state with certainty exactly what outcome will result from all possible future states of the world. In other words, it is not possible to write ‘complete’ contracts for complex commercial transactions.

It is incidentally simply unclear what is meant by the AEMC’s statement that it has written a ‘complete methodology’ for making a price determination. It is not possible to reduce making a price determination to a set of binding rules with clear outcomes under different situations. And the AEMC has not sought to do so. The Rules are now more detailed and more prescriptive, but are in no sense complete.

The inability to write complete, complex contingent contracts mean that certainty cannot be delivered by rules alone. A more realistic approach would be to consider how a range of instruments – legislation, rules, principles, guidelines, regulatory procedures and so on – could be used to make the regulatory regime to become more predictable. We discuss possible instruments in the next section.

Importantly, predictability also builds up over time. Through frequent interaction, regulated businesses can develop a greater understanding of the approach that is likely to be taken by the regulator in future decisions. A major step change in the regulatory framework, such as being proposed here, is likely to damage that gradual development of a better understanding of regulatory process.

6 Alternative approaches for delivering certainty and transparency

The AEMC has asserted that regulatory risk is deterring efficient investment. It has sought to provide greater certainty and transparency regarding transmission revenue regulation. To this end, it has codified the regulatory processes, and the methods and assumptions to be used in determining revenue caps, in prescriptive rules.

This report has concluded that increased codification alone is not an effective means of delivering certainty and transparency. However, other factors contribute to the overall predictability and openness of a regulatory framework. This section discusses alternative

avenues for influencing the transparency and certainty of regulatory decisions. It is only intended to be illustrative. That is, we are saying that an effective approach to creating a predictable regulatory regime needs to consider this mix of instruments, but we are not advocating any particular approach.

The section illustrates two points of relevance to the rule proposal:

- A wide range of instruments are available for addressing the predictability and certainty of a regulatory regime. Sole focus on one instrument – codification – is likely to be inefficient; and
- There have been very major changes to the regulatory framework over the last two years. Any assertion that the framework provides insufficient certainty needs to ensure that it is based on an understanding of the current rather than the previous arrangements.

6.1 Choice of regulatory instrument

Regulatory systems are usually constructed from a series of regulatory instruments. Generally, the allocation of a provision to a regulatory instrument is driven by the degree of certainty and flexibility required in relation to the matter of the subject of the relevant provision⁴. This is illustrated in Table 1.

Table 1: Possible regulatory instruments

Instrument	Characteristics
Legislation	Can only be amended by Parliament, and should include those elements of the regulatory framework that are to have the most protection from change (typically the basic parameters of the regulatory framework).
Regulations	Can only be amended by the executive, and so should include those elements of the regulatory framework that “flesh out” the basic parameters of the regulatory framework.
Licences	Confer an authority on the licence holder to undertake the licensed operations, and so should specify the parameters of that authority (including any limitations on it) and certain fundamental obligations that attach to that authority.
Codes, rules and guidelines	Contain the more detailed and technical requirements with which industry participants are required to comply and therefore must be susceptible to change in a flexible and timely manner so as to accommodate industry developments and changes. Such instruments can generally be amended unilaterally by the regulator, following a process of public consultation.

The regulatory framework for the NEM is established by the National Electricity Law. The Law contains a number of principles to govern the AER in the conduct of its economic regulation functions. The second reading speech indicates that these principles were deliberately placed in the Law, rather than the Rules, to ensure that they can not be changed by the normal rule change process and must be changed by legislation – “thereby providing

⁴ MCE Standing Committee of Officials (2004) *National Framework for Electricity and Gas: Distribution and Retail Regulation*, Forward and Issues paper, August.

greater certainty for the industry and consumers on the regulatory practice of the Australian Energy Regulator”⁵.

6.2 Binding principles and non-binding guidelines

Regulation through principles, rather than prescriptive rules, can still provide a reasonable level of predictability. Under such an approach, the Rules could provide a clear set of relatively high-level, outcome focussed principles regarding the regulation of transmission revenues, and bind the AER to act in accordance with the principles.

Principles will, inevitably, conflict (and this is also true of the criteria provided in the Rules). The AER would need to exercise judgement in resolving those conflicts. Predictability should build over time as market participants develop a greater understanding of the way in which the AER exercises its discretion.

Guidelines would provide transparency and certainty by providing more explicit statements of what the AER would implement the principles. They would be for guidance only, and not prescriptive or exhaustive. TNSP’s seeking direction or certainty could simply apply the methodologies and parameter values suggested in the guidelines. However, the AER would be free to consider any alternatives proposed by the TNSP according to their own merits.

Braithwaite⁶ argues that principles are more likely to enable legal certainty than prescriptive rules when regulating complex actions in changing environments with large economic interests at stake. Under a prescriptive approach, there is a tendency to write more and more specific rules over time to cover newly discovered loopholes or apparent inconsistencies. This makes the body of rules, as a package, less capable of consistent application. In an empirical study comparing enforcement of nursing home standards, he found that the Australian ‘principles’ based approach delivered greater reliability of decisions than the prescriptive standards used in the US.

The Productivity Commission⁷ argued that inclusion of transparent pricing principles within access legislation would help to ensure that regulators’ decisions were consistent with the intent of the legislation. Where a regulator is required to interpret vague and conflicting pricing criteria, it is open to accusations that its own views will affect pricing outcomes. The AEMC has criticised the principles in the National Electricity Law. It may be possible to improve their effectiveness by revising them.

Non-binding guidelines are widely used in other sectors. For example, in environmental legislation, where there may be many acceptable solutions to a regulatory requirement, guidelines are used as they do not limit the range of opportunities for compliance. In the UK, financial services regulation started out with vague, principle-driven self-regulation. This was replaced with State regulation through precise, specific rules (motivated by a pursuit of certainty). Then when problems arose, there was a shift toward regulation by principles with the status of many detailed rules moved back to non-binding guidance.⁸

⁵ National Electricity (South Australia) (New Electricity Law) Amendment Bill, second reading speech. [Insert full hansard/internet link].

⁶ Braithwaite J (2002) Rules and Principles: A theory of legal certainty. *Aus J Legal Phil* 27, 47-82

⁷ Productivity Commission (2001) *Review of the National Access Regime* Inquiry Report, Report No. 17

⁸ Black J (1990) *Rules and Regulators*, University of Chicago Press

6.3 Due process

Regulators are not infallible. Nor is there always a single ‘right’ answer or approach to a regulatory problem, as a degree of judgment is often required over factors such as how to balance the interests of different stakeholders and how to use regulatory discretion when there is limited data availability. There is always a risk of regulatory error occurring as a result of simple mistakes, poor judgement or regulatory capture.

Transparent regulation improves the predictability and reliability of regulatory decision-making by reducing the risk of errors and capture. It also provides incentives to develop more effective regulation. Transparency encompasses all parts of the regulatory process from the initial formulation of regulatory proposals through to their implementation and enforcement, and the overall management of the regulatory system (OECD, 2002).⁹

According to the OECD (2002), the most important elements of regulatory transparency practiced in OECD countries are: consultation with interested parties, plain language drafting, legislative simplification and codification, registers of existing and proposed regulation, and electronic dissemination of material. Box X sets out guidelines on ensuring regulatory transparency developed by the UK Better Regulation Taskforce.

Box 2: Processes to ensure transparency

Transparency: Regulators should be open, and keep regulations simple and user-friendly.

- Policy objectives, including the need for regulation, should be clearly defined and effectively communicated to all interested parties
- Effective consultation must take place before proposals are developed, to ensure that stakeholders’ views and expertise are taken into account.
- Stakeholders should be given at least 12 weeks, and sufficient information, to respond to consultation documents.
- Regulations should be clear and simple, and guidance, in plain language, should be issued 12 months before the regulations take effect.
- Those being regulated should be made aware of their obligations, with law and best practice clearly distinguished.
- Those being regulated should be given the time and support to comply. It may be helpful to supply examples of methods of compliance.
- The consequences of non-compliance should be made clear.

Source: Better Regulation Taskforce (2003) *Principles of Good Regulation*

Consultation is one of the principal tools for providing transparency. However, trade-offs have to be made between increased participation and effective implementation of the regulation: more participation may lead to less effective decision-making, and effectively to stagnation in the regulatory system¹⁰.

⁹ OECD (2002) *Reviews of Regulatory Reform: Regulatory Policies in OECD Countries*, p. 66

¹⁰ Baldwin, R and Cave, M (1999) *Understanding Regulation: Theory, Strategy and Practice*, p.79

The Utility Regulators Forum¹¹ suggests that “Regulators should establish visible decision-making processes that are fair to all parties and provide rationales for decisions”. It also acknowledges that may not be possible to provide some information, because it is confidential. To address this, it recommends that the rules about the treatment of information, including confidential information, should be identified early in the decision-making process and explained to stakeholders.

Should consultation procedures be placed in rules? In the UK, the Department of Trade and Industry argued in 1998 that a greater degree of formality should be introduced into regulatory procedures and proposed that each utility regulator should be placed under a statutory duty to consult on, and then to publish and follow, a code of practice governing their consultation and decision-making processes. It was envisaged that the codes of practice would cover consultation on forward priorities, procedures, and timetables for taking key decisions, the publication of decision-making criteria, arrangements for third party representation, the use of hearings and various ways of offering views to regulators.

Appeal rights can also contribute to improved predictability of regulatory decisions: allowing merits reviews of decisions can improve accountability of regulators; promote regulatory and commercial learning; and through time, build a body of precedent decisions. However, merits reviews can also increase uncertainty over aspects of the regulatory environment. Perhaps more importantly, it is unrealistic to expect that the appeal body’s decisions will necessarily be of a higher quality than the regulators. There is a risk that the appeal body would have insufficient expertise given the highly technical nature of the electricity sector, and would take inappropriate decisions.

6.4 Governance arrangements

Two elements of governance arrangements have a significant role to play in ensuring regulatory certainty: the corporate structure of the regulator, and its independence.

Where a single individual is appointed as regulator, there is risk of unpredictable decision-making, and of discontinuity in decision-making when new appointments are made. The UK Better Regulation Taskforce noted that, in the past, there had been clear shifts in economic regulation policy when one individual regulator has taken over from another¹². A Commission structure can offer greater stability, particularly if appointments are staggered. The AER has been established as a body corporate with three members, addressing the risk of unpredictable decision-making by an individual regulator.

Governance arrangements can also help to minimise the risk of unpredictable decision-making due to political interference. In establishing the AER and the AEMC, Governments have attempted to allocate regulatory functions so that the organisation making the rules is not the organisation enforcing them. Separation of rule-making from rule implementation is intended to avoid conflicts of interest. It also underlines the fact that setting the policy framework is inherently a more ‘political’ process than applying the rules once the framework is established¹³.

¹¹ Utility Regulators Forum (1999) *Best Practice Utility Regulation* Discussion Paper <http://www.accc.gov.au/content/index.phtml/itemId/332190/fromItemId/3894>

¹² Better Regulation Taskforce (2001) *Economic Regulators*

¹³ A discussion of these issues is given in Carlos Ocana (2002) Trends in the management of regulation: a comparison of energy regulators in OECD countries. International Energy Agency (IEA) Working Paper, Paris. <http://rru.worldbank.org/PapersLinks/Design-Management-Regulatory-Institutions/>. They are also

Regulators whose decisions directly affect individual company's profits need to be kept at arms length from Government, to remove any perception of political interference in the decision-making process. It is not always easy to draw a line between operational decisions and policy, and there is some over lap. However, the AEMC, in seeking to codify the transmission revenue cap decision-making process as fully as possible, has effectively taken on part of the regulator's operational role.

The AEMC's governance arrangements mean that it has an intermediate level of independence from Government, in that it is subject to high level policy direction by the Ministerial Council on Energy. This is appropriate for the AEMC's role in setting the the national energy market rules, but may not be appropriate for operational decision-making.

7 Conclusions

The AEMC has sought to make a major shift in the structure of economic regulation, by introducing a much higher level of codification in the Rules, and a reduced reliance on other instruments.

There are two main weaknesses with this approach. First, it is based on a view that there is a problem of a lack of clarity, certainty, and transparency in the regulatory regime. This view is based on submissions by market participants. It is not supported by any examination of the level of transmission investment, or any attempt to show that investment has been unduly constrained by revenue caps or by uncertainty due to inadequate codification.

Second, if there is a significant problem arising from uncertainty in the regulatory regime, then seeking a high level of codification is likely to be an ineffective and inefficient response. It is not possible to reduce the resolution of complex commercial processes to the successive application of binding rules. The attempt to do so is likely to reduce rather than increase certainty and predictability.

A more efficient approach to regulatory design would be to consider the characteristics of the regulatory regime which affect both its predictability and other aspects of its performance. This would entail consideration of the role of legislation, rules, binding or non-binding principles, and guidelines; the regulatory process; and the governance arrangements for the regulatory body.

Mountain Nuttall Consulting

Regulation and business strategy

A comparison of the capital expenditure incentives in the AEMC's Draft Rules and in the AER's Statement of Regulatory Principles

A report to the AER

10 March 2006

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1. Introduction and background

The AEMC's recently proposed rules for the economic regulation of transmission services has introduced a new regulatory design applicable to Transmission Network Service Providers (TNSPs) to replace the regulatory design developed by the ACCC and adopted by the AER.

This report focuses on the incentives for capital expenditure. The AEMC has described its proposed incentive regime for capital expenditure as a continuation of the incentive regime set out in the AER's Statement of Regulatory Principles (SRP). However, there are a number of differences:

- The AEMC regime provides an efficiency incentive related to the return on the difference between target and actual expenditure during the regulatory period. The SRP provides an efficiency incentive related to the return *and* depreciation on the difference between target and actual expenditure during the regulatory period.
- The AEMC regime provides for capital expenditure targets to be reset during the regulatory period. The design of this mechanism is very different to the SRP contingent project mechanism.
- The AEMC regime provides for ex-post asset revaluation. The SRP does not provide for this.
- The AEMC regime provide for stranded assets to be excluded from the RAB. The SRP does not provide for this.

We have been asked to:

- quantitatively compare the incentives applying to capital expenditure in the AEMC's Draft Rules, with the capital expenditure incentives set out in the SRP;
- review the reasons set out in the AEMC's Rule Proposal Report for the changes to the SRP incentive.

The next two sections report our conclusions on these two areas. The study methodology is described in Appendix A. Appendix B contains tables of results from scenario analyses.

2. Quantitative comparison

2.1. Summary

The financial incentives on capital expenditure developed by the AEMC and AER are meant to align the interests of shareholders and customers by allowing shareholders to benefit from efficiency gains if actual expenditure is below the regulatory targets – or equivalently to suffer losses if expenditure overshoots the regulatory targets. The quantitative comparison of these incentives therefore focuses on how any gain/loss is shared between shareholders and consumers.

From our analysis it is clear that:

- the AEMC’s incentive is asymmetrical - the pre-tax penalty for over-spending is weaker than the bonus for under-spending; and
- the AEMC’s capex efficiency incentive is considerably weaker than the AER’s.

For example, if TNSPs spend 15 % more or less than their capex target, the AER’s incentive scheme delivers a symmetrical median pre-tax power of incentive of 21% on average across the regulatory period and across all TNSPs.

By contrast, the AEMC’s incentive scheme delivers a median pre-tax incentive of 15.5% if spending is 15% below the initial regulatory target, but 12.7 % if the TNSP spends above the target by 15%.

The asymmetry is attributable to the AEMC’s re-opener that allows TNSPs to apply for the initial targets to be reset “where it needs to undertake capital expenditure ... and where such expenditure cannot be accommodated within the expenditure forecast”.¹

Besides the re-opener, the other reason that the AEMC’s incentives are weaker than the AER’s incentive is because the AEMC’s incentive does not incentivise depreciation during the regulatory period.

This rest of this summary section illustrates the impact of these differences with reference to specific TNSPs. While the impact of the different AER and AEMC incentive designs varies to a limited degree amongst TNSPs, these examples can be considered representative of the effect of the different incentives across all TNSPs. Appendix B contains the results of the same studies referred to here, for all TNSPs

¹ Australian Energy Markets Commission, February 2006(a). “Transmission Revenue: Rule Proposal report”. Page 83.

Incentives to increase efficiency

Our modelling shows that if Powerlink underspends the capex target of its existing revenue control by 15 % this would decrease expenditure by around \$116m (in present value terms) compared to the five year regulatory target. In this case with the AEMC's incentive, Powerlink's shareholders would be better off by \$20m and its customers would gain the benefit of the remaining \$94m through lower prices. By contrast, under the AER's more powerful incentive, Powerlink's shareholders would be better off by \$26m.

The prospect of a \$20m gain over five years under the AEMC's incentive, although less than the AER's incentive, still appears at first sight to provide a meaningful incentive. However, this gain is before counting the cost of the expenditure needed to bring about that efficiency saving. Such costs could include investment in more efficient capital, or the implementation of better processes, or management incentives and so on.

Furthermore, stated as a percentage of Powerlink's Regulated Asset Base (RAB), the \$20m gain before costs is, after tax, equivalent to an annual rate of return of just 0.15 % on regulated assets. Even if such significant savings could be achieved without incurring additional expenditure – which we don't think is likely - the value of such savings to shareholders would be to increase the return on regulated assets from the post-tax real WACC of 4.56 %, to just 4.71 %. There is reason to doubt that such small additional returns would be sufficient to incentivise the effort required to deliver a \$120m efficiency saving.

Incentives to control overspending

If SP Ausnet overspends the capex target if its existing control by 15 % or \$49m (in present value terms), then under the AEMC's incentive SP Ausnet's shareholders would lose \$5.4m and SP Ausnet's customers would pay the remaining \$43.6m through higher charges. By contrast, under the AER's incentive SP Ausnet's shareholders would lose \$10.2m in the same circumstances.

While a penalty of \$5.4m over five years under the AEMC's incentive would not be welcomed by shareholders, when this amount is stated in terms of its impact on the annual rate of return on regulated assets it is equivalent to just 0.08 %. This would therefore effectively decrease SP Ausnet's post-tax real return on assets from 4.38 % (the regulatory determination of allowed WACC) to 4.30 %. With such weak penalties for overspending the regulatory target, there appears to be little reason for SP Ausnet to be concerned if it spends above its regulatory targets.

Furthermore, to the extent that SP Ausnet's true cost of capital is less than 4.30 % (the regulatory determination of the allowed return after subtracting the 0.08 % penalty for overspending) then under the AEMC's incentive scheme SP Ausnet would be better-off, not worse-off, if it spends above its target. To put this another way, with the AEMC's incentive, if SP Ausnet exceeded its regulatory target by 15%, SP Ausnet's true cost of

capital needs to be just 0.08 % lower than the regulatory determination of the cost of capital for it to be better-off despite having spent above its regulatory target by 15%.

2.2. Overview of quantitative comparison

The financial incentives developed by the AEMC and AER are meant to align the interests of shareholders and customers by allowing shareholders to benefit from efficiency gains when expenditure is brought below the regulatory target – or equivalently to suffer losses if expenditure overshoots the regulatory targets. The quantitative comparison of these incentives therefore focuses on how any gain/loss is shared between shareholders and consumers. The model expresses this in dollars and also as percentage changes in the post tax annual rate of return on assets.

The model that we have developed to do these calculations uses actual data on capital structure, the value of the RAB, the ACCC's determination of the cost of capital, the remaining life of assets, the ACCC's determination of expenditure targets, and the breakdown of expenditure by asset class for all six TNSPs. The modelling therefore provides a calculation of the efficiency incentives for each TNSP specific to their own unique circumstances.

Monte Carlo simulation of the incentive schemes is used to objectively assess the properties of those incentives under a wide range of outcomes (i.e. possible differences between actual expenditure and target expenditure).

The simulation involves specifying the mean and variance of the probability distribution of actual capex compared to target capex; and the mean and variance of the revised mid term target expenditure against the actual expenditure (if the revenue cap is re-opened). The distribution in both cases is assumed to be normal. The model methodology is set out in Appendix A.

The variance of the actual expenditure against the target expenditure is assumed to be 9%, and the variance of the revised mid term target expenditure against the target expenditure (if the revenue cap is re-opened) is assumed to be 6.25%. There is no special significance in these numbers other than that the variance of the actual and mid-term target is defined to be smaller than the variance of the actual and initial target expenditure.

To analyse the differences between the AEMC and AER incentives, in the rest of this sub-section three sets of Monte Carlo simulations have been produced on the basis of the following three assumptions:

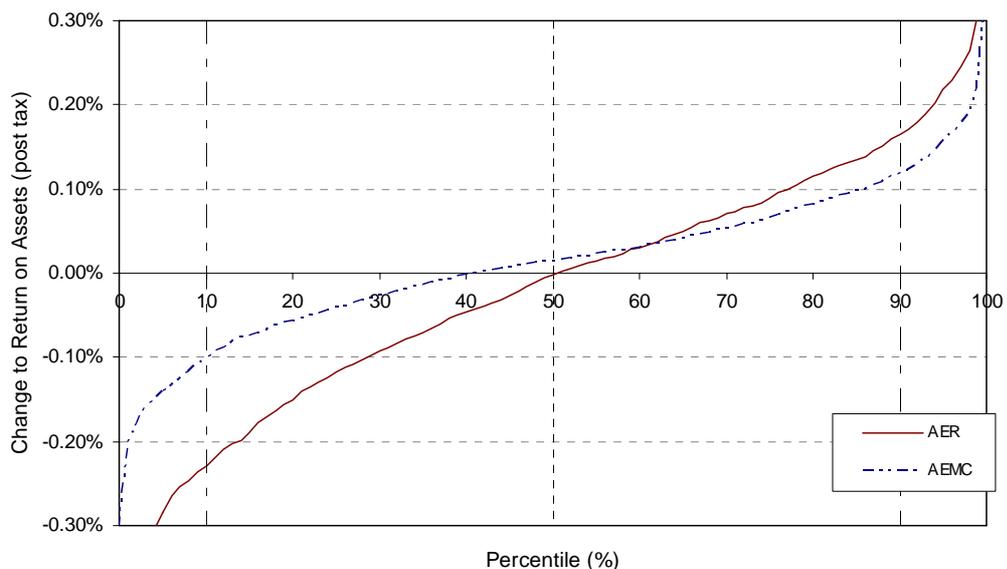
- **Expected actual capex equals target capex:** this compares the incentives assuming that the expected mean actual capex equals the target capex. The results are discussed in section 2.2.1

- **Expected actual capex below target capex:** this compares the incentives assuming that the expected mean actual capex is 15% below the target capex. The results are discussed in section 2.2.2.
- **Expected actual capex exceeds target capex:** this compares the incentives assuming that the expected mean actual capex is 15% above the target capex. The results are discussed in section 2.2.3.

2.2.1. Comparative analysis when expected actual capex equals target capex

Figure 1 below is a plot of the probability distribution of the change in the annual rate of return on assets (on the y-axis) with the probability percentile (on the x-axis). This specific plot uses the results of the modelling for TranGrid.

Figure 1. Probability distribution of change to annual rate of return on assets assuming expected actual capex equals target capex



This plot shows the overall weaker incentive of the AEMC scheme due to the removal of depreciation from the incentive. The plot also shows the asymmetry in the incentive due to the AEMC re-opener. For example, under the AER scheme with the expected actual capex set equal to the target capex, the symmetrical design of the incentive means that there is a 50:50 probability that the TNSP will gain or lose (this is illustrated in Figure 1 since the plot of the change to the rate of return on assets for the AER cuts the x-axis at the 50 percentile mark). In the same circumstances with the AEMC incentive scheme, although there is still a 50:50 probability of under or overspending the original target, there is only a 40% probability that the TNSP will be worse-off (this is illustrated in Figure 1 where the curve for the AEMC cuts the x-axis at the 40 percentile mark).

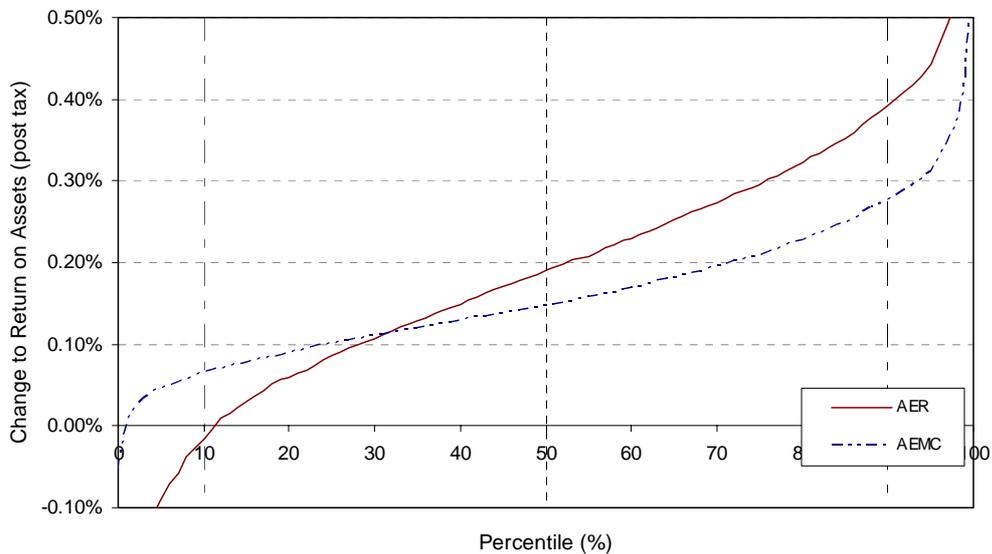
Furthermore, the reduction in the return on assets if actual capex is less than target capex under the AEMC scheme compared to the AER scheme, is significantly less than the reduction in the return on asset for overspending on the original targets. That is, the re-opener significantly reduces the risk of financial losses to TNSPs – as it is intended to do.

The asymmetry of the AEMC incentive compared to the AER incentive can also be clearly observed by comparing the relative change to return on assets at the 10th and 90th percentiles.

2.2.2. Comparative analysis when expected mean actual capex is below target capex

Figure 2 plots of the probability distribution of the change to the rate of return on assets respectively with the probability percentile on the x-axis, for Powerlink, assuming that the expected mean actual capex is 15% below the target capex. In this figure it is clear that over most of the probability distribution, the AER's incentive has a significantly higher power than the AEMCs. Over the range of the 10th to 30th percentiles the AEMC's incentive will however produce slightly higher annual returns.

Figure 2. Probability distribution of change to annual rate of return on assets assuming expected actual capex is below target capex



The figures in Table 1 below are a snap shot of the 10th percentile, median and 90th percentile values for Powerlink, of the present value of the overspend/underspend, and the corresponding present value of the profit/loss to the TNSP (pre tax), the power of the incentive (pre tax), and the percentage change to the return on assets (post tax). The relatively lower power of the AEMC incentive is observed in the decrease of the median

power of the incentive from 22.3% in the case of the AER's incentive to 16.2% in the case of the AEMC incentive. A comparison table for all 6 TNSPs is provided in Appendix B.

Table 1. Table of results assuming expected capex is 15% below target capex

Revenue model metrics		Powerlink - AER	Powerlink - AEMC
PV of (overspend) / underspend [\$m]	10%	\$ 10.2	\$ 10.2
	Median	\$ 115.6	\$ 115.6
	90%	\$ 217.4	\$ 217.4
PV (loss)/ profit pre-tax [\$m]	10%	-\$ 1.6	\$ 9.0
	Median	\$ 25.5	\$ 19.8
	90%	\$ 51.1	\$ 35.6
Power of incentive pre-tax	10%	9.6%	6.7%
	Median	22.3%	16.2%
	90%	33.8%	34.8%
Change to Return on Assets (post tax)	10%	-0.02%	0.07%
	Median	0.19%	0.15%
	90%	0.39%	0.28%

2.2.3. Comparative analysis when expected actual capex is above target capex

Figures 3 and 4 below are respectively plots for SP Ausnet of the probability distribution of the present value of underspend/(overspend) of actual capex compared to the initial target, and the change to the annual (post tax) rate of return on assets, with the probability percentile on the x-axis in both figures.

These plots show the asymmetry in the incentive due to the AEMC re-opening mechanism when the probability of overspending the targets is high. Under these conditions the expected change to the return on assets is almost halved compared to the AER scheme. This suggests a significant reduction in the incentive power of the AEMC scheme to control spending above the regulatory target.

Figure 4. Probability distribution of PV of underspend assuming expected capex is above target capex

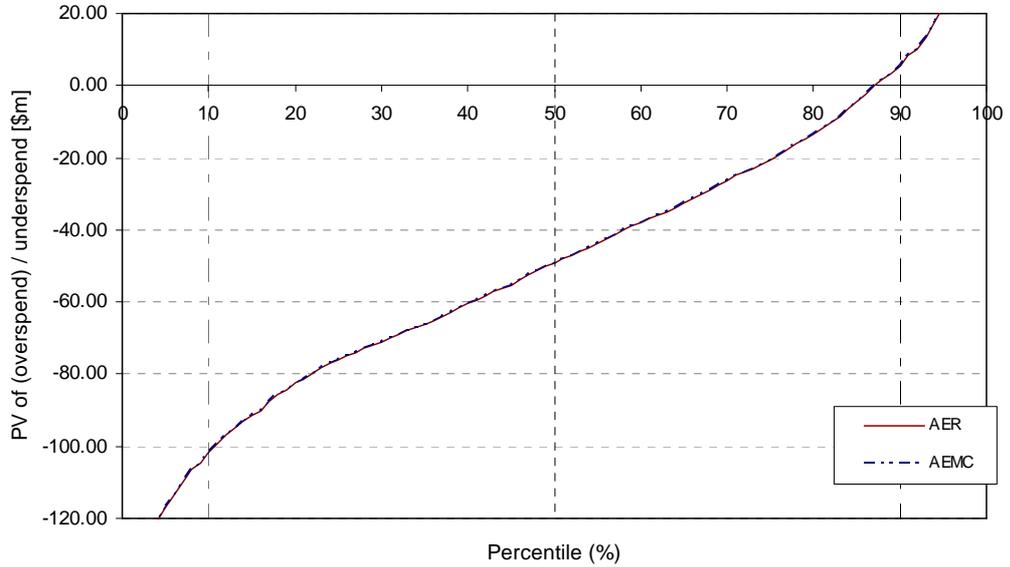
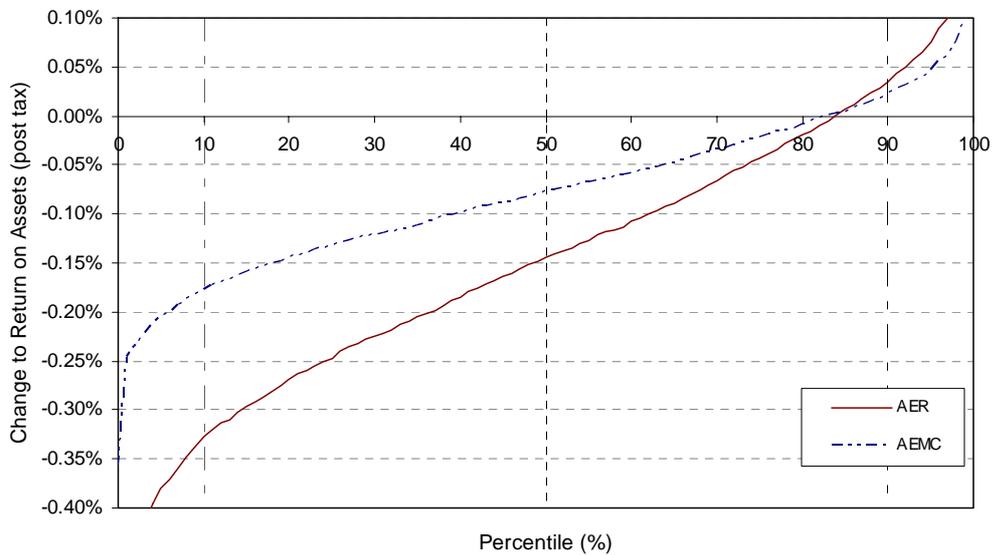


Figure 5. Probability distribution of Change to Return on Assets assuming expected capex is above target capex



The figures in Table 2 below are a snap shot of the 10th percentile, median and 90th percentile values for SP Ausnet of the present value of the overspend/underspend, and the corresponding present value of the profit/loss to the TNSP (pre tax), the power of the incentive (pre tax), and the percentage change to the annual (post tax) rate of return on assets. The relatively lower power of the AEMC incentive is observed in the decrease of

the median power of the incentive from 21.3% in the case of the AER's incentive to 11.7% in the case of the AEMC incentive. Similarly the asymmetry of the incentive is clearly visible. For example with the AER's incentive, an overspend of \$49.1m, results in financial losses of \$10.2m which translates to a 0.14 % point decrease in the rate of return on assets. By contrast, for the same level of overspend, the AEMC's incentive approximately halves the losses to the TNSP to around \$5.4m which translates into a 0.08 % point change in the rate of return on assets. A comparison table for all 6 TNSPs is provided in Appendix B.

Table 3. Table of results assuming expected actual capex is above target capex

Revenue model metrics		SP Ausnet - AER	SP Ausnet - AEMC
PV of (overspend) / underspend [\$m]	10%	-\$ 101.7	-\$ 101.7
	Median	-\$ 49.1	-\$ 49.1
	90%	\$ 5.4	\$ 5.4
PV (loss)/ profit pre-tax [\$m]	10%	-\$ 23.2	-\$ 12.7
	Median	-\$ 10.2	-\$ 5.4
	90%	\$ 3.5	\$ 2.2
Power of incentive pre-tax	10%	1.3%	-0.1%
	Median	21.3%	11.7%
	90%	40.9%	23.8%
Change to Return on Assets (post tax)	10%	-0.33%	-0.18%
	Median	-0.14%	-0.08%
	90%	0.04%	0.02%

3. Review of the AEMC’s reasons for changes to the SRP capex incentive

3.1. Introduction

As described in the introduction, the AEMC’s capex incentive regime involves four elements: financial incentives based on the difference in return on actual and target capex, a re-opener provision, and provisions for ex-post optimisation including asset stranding. While the re-opener and ex-post optimisation provisions do not provide explicit financial incentives in the same way as the financial incentive on the difference in the return on actual and target capex, they do affect incentives. This was quantified in the case of the re-opener in the previous section.

The AEMC’s rule proposal report accompanying the Draft Rules provided reasons (in some areas) for changing the incentive architecture that the ACCC had developed. This section reviews the reasons provided in the AEMC’s report.

3.2. AEMC’s justification for changes to financial incentives on capex

The financial incentive on capex set out in the Draft Rules does not expose TNSPs to the difference in depreciation on their target and actual capex. As described in Section 2 above, the effect of this is to decrease the power of the incentive to TNSPs from an average of around 21% (pre-tax) with the SRP, to 15.5 % with the AEMC’s incentive.

The AEMC’s justification for this change is that including depreciation “provides an incentive for TNSPs to shift the allocation of reported actual capital expenditure away from short-lived assets (and thereby gaining an efficiency benefit) and towards long-lived assets (incurring a penalty, which will be less than the benefit)”²

It is not clear to us what the AEMC means by the suggestion that TNSP’s will “shift the allocation of reported actual capital expenditure”. Actual expenditure will be known with certainty and it is difficult to see how TNSPs can meaningfully “shift the allocation of reported actual expenditure” on short lived assets so that they appear to be long lived assets, without intentionally misreporting actual expenditure. Even if TNSPs attempted

² Ibid, page 85.

to misreport expenditure – and there is no reason to think they would even attempt this in the first place – this would be easy to detect and correct.

It may be that what the AEMC really means here is that by including depreciation within the incentive, the power of the incentive for short-lived assets is stronger than it would be for long-lived assets, and hence TNSPs may be encouraged to try harder to find efficiencies on short-lived assets than on long-lived assets.

However this age-based incentive discrimination is not significant unless there is a big difference in asset life. In other words, the effect is only significant in comparing incentives on 10 year (and shorter) assets versus 30 year (and longer) assets. Furthermore in the last six TNSP revenue control decisions by the ACCC, on average only 5% of total target expenditure has been on short-lived assets, and the maximum expenditure on short-lived assets for any TNSP was 8%.

It is improbable that TNSPs would direct their attention to finding efficiencies in short-lived assets, at the expense of looking for efficiencies in long-lived assets. This is because expenditure on short lived assets is such a small proportion of total expenditure and so despite the higher power of incentive, the gains from big reductions in expenditure on short lived assets will be small compared to the gains from reductions in expenditure on long lived assets – where more than 95% of total expenditure lies. To put it another way, it seems implausible that including depreciation as part of the incentive would cause TNSPs to focus their effort on achieving efficiencies on short-lived assets such as personal computers and office furniture when greater value for shareholders and consumers would be created by efficiently reducing expenditure on long lived, expensive items such as transformers and conductors.

3.3. AEMC’s justification for rejection of the contingent project regime and introduction of a re-opener mechanism

The AER’s contingent project scheme works very differently from the AEMC’s re-opener. The contingent project arrangement identifies contingent project triggers and specifies, broadly, the possible projects that may result from those triggers at the time of the revenue control. If a contingent project trigger is satisfied during the regulatory period, a contingent project capex allowance will be determined independently from the ex-ante allowance. The contingent project incentive runs for five years and has the same incentive properties as capex covered by the main control.

By contrast, the AEMC’s re-opener is much broader and, subject to a few restrictions, allows the revenue cap to be reopened where “such capex cannot be accommodated within the original capex allowance”.³ Further the re-opened control only runs for the

³ Ibid, page 83.

remaining period until the next revenue control. Therefore the incentive properties of the AER's contingent project regime and the AEMC's re-opener regime are very different.

The AEMC's decision to include a comprehensive re-opener in place of the AER's contingent project regime reflects the AEMC's view that the SRP capex controls "provides TNSPs with an incentive to delay *required* expenditure in excess of that forecast in the regulatory period, since expenditure in excess of forecast levels will result in the TNSP incurring a penalty"⁴.

The prospect of a financial loss when expenditure exceeds the regulatory target (or a gain when expenditure is below the target) is of course the intended outcome of incentive-based regulation adopted by the AER and other jurisdictional regulators in Australia to-date.

The AEMC's re-opener, by allowing the initial targets to be reset if actual expenditure turns out (or is expected to turn out) higher than target expenditure therefore represents a significant departure from historic precedent in the application of incentive-based regulation of network utilities in Australia. The re-opener reflects the AEMC's assumption that if expenditure is above the target it is "required". In other words the AEMC seems to have assumed that if TNSPs spend above the target that this is because the initial target was set incorrectly, rather than that factors within the TNSP's control may have contributed to expenditure above the target. No empirical or theoretical evidence is provided to support this important assumption.

While the AEMC's rule proposal report claims that a materiality threshold has been included to "limit the frequency of such re-openings and to ensure that they do not undermine the overall CPI-X incentive framework"⁵ the provisions of 6.2.12 (a)(3) of the Draft Rules do not bear this out. In particular 6.2.12(a)(3) of the Draft Rules indicates that the threshold relates to the size of project to be referred to in the re-opener application, not the level of overspend in relation to the initial regulatory target. In other words, as we understand the Draft Rules, the actual capex could exceed (or be expected to exceed) the target by just \$1 before a re-opener application can be made to the AER.

The AER has described its capex incentives as low powered. Our analysis of the AER and AEMC's incentive regime discussed in Section 2 supports the AER's description of the SRP capex incentive as low powered. The analysis in that section demonstrated however that the effect of the AEMC's re-opener combined with the withdrawal of depreciation from the incentive, effectively halves the power of the AER's incentive if the overspend is assumed to be around 15% of the target expenditure level. As illustrated in Figure 5, for overspend above this level the difference between the AER and ACCC's incentive grows even wider.

Leaving aside the issue of whether expenditure above the target is "required" or whether it may be at least in some measure inefficient expenditure, the AEMC has not provided

⁴ Ibid, page 73.

⁵ Ibid, page 74.

any theoretical or empirical evidence to support its view that the SRP design does in fact provide TNSPs with an incentive to delay expenditure in excess of the target. Our analysis set out in section 2 concluded that in the case of SP Ausnet with the AEMC's incentive, their true cost of capital needs to be just 0.08% lower than the allowed WACC for it to be a net beneficiary if it spends above the regulatory target. In the same circumstances, with the SRP incentive SP Ausnet's true cost of capital needs to be just 0.14% lower than the allowed WACC. This is still a relatively insignificant difference and it calls into question the AEMC's assertion that the SRP provides an incentive to delay required expenditure.

3.4. AEMC's justification for ex-post optimisation

The Draft Rules gives the AER discretion to conduct an ex-post prudency review of capital expenditure to determine if it is efficient and prudent, and if the AER determines that it is not efficient, not to include such expenditure in the RAB. The rule proposal report notes that "the SRP also allows for a prudency review"⁶ but, beyond alluding to this no other justification is given - if indeed alluding to the AER's purported use of optimisation is intended to be a justification.

However it is not correct to claim that the SRP provides for ex-post prudency reviews. Whether to allow ex-post adjustment of the RAB was one of the central issues in the debate leading up to the publication of the SRP. During this debate the ACCC frequently referred to the investment uncertainty arising from ex-post optimisation. The SRP states that *"At the end of the regulatory control period the closing RAB will be set equal to the depreciated value of the actual investment undertaken during the regulatory period, regardless of whether this closing RAB is larger or smaller than the closing RAB calculated on the basis of the target investment allowance. The effect of this arrangement is that if a TNSP spends less than its expenditure target during the regulatory period, it retains the benefit of that underspend (both return on and of) for the remainder of the regulatory period. Conversely, if it exceeds its expenditure target during the regulatory period it suffers a penalty on that overspend (both return on and of) for the remainder of that regulatory period."*⁷ This clarifies that there is no provision for ex-post optimisation in the SRP.

Furthermore the AEMC's decision to include ex-post optimisation of expenditure during the last regulatory period is perplexing in view of its own recognition that such optimisation is information intensive and subjective⁸ and its decision, for these reasons inter alia, not to support periodic optimisation of the RAB.

⁶ Ibid, page 55

⁷ ACCC, 2004. "Statement of Principles for the regulation of electricity transmission revenues – background paper." Page 57.

⁸ AEMC 2006(a), page 53.

Optimisation of the RAB and ex-post optimisation of capital expenditure during the last regulatory period may employ different assessment processes and techniques but the underlying concept – reviewing the value of historic expenditure – is the same. Achieving internal consistency would suggest that if concerns over information intensity and subjectivity are the basis of the AEMC’s rejection of periodic RAB optimisation, then such reasoning should apply equally in the rejection of ex-post optimisation of expenditure during the last regulatory period.

It may be that, despite the downsides of subjectivity and information intensity, the AEMC believes that by setting out the criteria for the conduct of an ex-post review to be conducted by the AER, that this will provide the clarity necessary to ensure that ex-post optimisation will be an effective element of the regulatory regime. But these criteria, set out in clause 6.2.3(d) of the Draft Rules do not advance upon, or contradict, the criteria that have been applied by the ACCC in its only optimisation decision to-date (TransGrid and Energy Australia’s investment in the MetroGrid project) that has resulted in expenditure being excluded from the RAB.

4. Appendix A: Methodology

4.1. Key methodological issues

As described in the introduction, the AEMC's capex incentive regime involves four elements: financial incentives based on the difference in return on actual and target capex, a re-opener provision, and provisions for ex-post optimisation and asset stranding. By comparison, the AER's regime contains financial incentives based on the difference in the return on and of actual and target capex; and a provision for contingent project incentives.

In our analysis we have not attempted to account for any efficiency incentive that may arise as a result of the optimisation and stranding provisions. As the AEMC notes in the Rule Proposal Report⁹ optimisation is subjective and the strength of the incentive depends on clarity on when/if assets will be optimised. We agree with this and it logically follows that it is not possible to objectively determine with any certainty what efficiency incentive, if any at all, will arise if the AER chooses to undertake an ex-post optimisation or withdrawal of assets from the RAB due to stranding.

With respect to the difference between the AER's contingent project scheme and the AEMC's re-opener, as noted in the previous section, the design of these regulatory instruments is quite different. To ensure comparison of like-with-like, our modelling of the AER and AEMC schemes examines the incentives on capex covered by the ex-ante cap, which by definition excludes contingent projects. This is reflected in our modelled results which is based on relatively narrow variance of 9%, below what could be expected to arise if a contingent project had been triggered.

The model could have been adapted to calculate the outcomes if a contingent project had been assumed to be triggered. However, this would inevitably introduce an element of subjectivity. This is because in modelling incentives across the range of possible outcomes - which Monte Carlo simulation achieves - we would have needed to make assumptions on the likelihood that a contingent project is triggered i.e. the likelihood that spending above the target is attributable to a contingent project rather than overspend against expenditure provided in the ex-ante target. We decided against providing for contingent projects because of the additional subjectivity that would inevitably result from such a provision.

However our view is nevertheless that the comparison of the AER and AEMC incentives is unlikely to differ even if separate provision had been made for the inclusion of contingent projects. This is because with the AER scheme the financial incentives on

⁹ Ibid, page 53.

contingent projects are exactly the same as the incentives under the main ex-ante capex controls. Therefore different incentives may only arise if the mean and variance of actual expenditure versus target expenditure for contingent projects is different to the mean and variance of expenditure under the main control. Since both the main control and the contingent project regime involve 5 year incentives, we have no reason to believe that this will be the case.

Another key methodological issue relates to how the AEMC’s re-opener mechanism will work. We found clause 6.2.12 of the Draft Rules to be internally inconsistent and therefore sought advice from the AER’s lawyers on how the Draft Rules on re-openers should be interpreted. On the basis of this advice we have modelled the re-opener assuming that whenever total actual capex during the regulatory period is expected to exceed total target capex, and subject to the conditions of 6.2.12(a)(2) and (3) of the Draft Rules, the revenue cap will be re-opened. This interpretation is consistent with the AEMC’s draft report which states that “The TNSP can apply for a re-opening of a revenue cap where it needs to undertake capital investment to meet its regulatory obligations, and where such expenditure cannot be accommodated within the expenditure forecast.”¹⁰ A more detailed description of the implementation of this reopener mechanism in the Monte Carlo modelling is set out in Appendix A.4.5

4.2. Input data

The input data used in the model and the source of these data is summarized in Table 4 below.

Table 4. Input data

Data	Source
Pre-tax and post tax vanilla WACC for all six TNSPs.	ACCC Final Decision WACC as recorded in their respective PTRM/Baby Blue models (as applicable) for each TNSP.
Proportion of capex target by asset class	These data are contained in the PTRM/Baby Blue models (as applicable) for each TNSP. There is a wide variety of asset categories used in these models. To standardise the asset data into the five categories that we have used (very long life, long life, medium life, short life and undepreciated) we allocated all expenditure based on the definitions of these asset categories as recorded in the input screen of our model.
Capex target at start of the regulatory control period for each year of the control period for all TNSPs	These data were obtained from the ACCC’s Decision documents for the currently applicable revenue control decisions for all six TNSPs.

¹⁰ Ibid, page 83.

Average remaining life of the assets in the RAB for all TNSPs.	These data were obtained from a calculation based on data provided in the PTRM/Baby Blue models (as applicable) for each TNSP.
Marginal income tax rate	Under the Tax Act this is 30% for all TNSPs
RAB at the start of the regulatory period	These data were obtained from clause 6.2.3(c)(1) of the AEMC's Draft Rules.

4.3. Regulatory algebra

The modelling produces results based on the incentive designs specified in the SRP and the Draft Rules. The AER's calculation entails the determination of a regulated revenue stream based on the SRP's arrangement whereby the closing RAB at the end of the regulatory period is set equal to the depreciated value of the actual expenditure during the regulatory period. During the regulatory period, the revenues are based on the depreciation and return on target capex.

The calculations needed to implement the AEMC's incentive – other than those needed to implement the re-opener mechanism – are exactly the same as the AER's except that the closing RAB is based on the written down value of the actual expenditure after depreciation based on target expenditure - rather than depreciation based on actual expenditure - has been subtracted.

The calculation of revenues is based on the architecture used in the current version of the ACCC's Post Tax Revenue Model, although we have modified the calculation to correct for errors in that model. The details of the relevant PTRM calculations (and our corrections where appropriate) are as follows:

- With the PTRM, half the WACC is added to the RAB for the year in which capex is incurred. This implements the assumption that capex occurs evenly through the year. Our modelling has amended this “half-WACC” calculation in two ways.
 - Firstly we have included half the WACC in the calculation of the MAR during the year in which the expenditure is incurred, rather than add this amount to the RAB. This amendment is neutral in present value terms. However we have implemented this difference in our modelling because unless this amendment is made, the PTRM would result in a four year incentive rather than five year incentive. This is because under the SRP and the AEMC's Draft Rules, the RAB is reset in the sixth year based on actual expenditure and so any difference between target and actual expenditure in the fifth year would be eliminated before TNSP revenues would be affected. Therefore there would be no difference between

actual and target expenditure in the fifth year, and hence no incentive in that year. This is not what is intended in either the SRP or the AEMC's Draft Rules.

- The second change we have made is to calculate the half-WACC based on the effective compound half-yearly rate, whereas the PTRM simply divides the annual WACC by 2. Our calculation of "half-WACC" is needed to ensure that the present value of depreciation and return over the life of the asset discounted at the WACC equals the value of the asset. This result is not achieved if the PTRM approach is used.
- With the PTRM, depreciation of the asset only begins the year after the asset enters the RAB. While there is nothing wrong with this – from an economic perspective the depreciation profile is somewhat arbitrary - this treatment of depreciation in the PTRM has two significant effects.
 - Firstly it means that there is no incentive on depreciation in the fifth year of the regulatory control. We recognise that this is not consistent with the SRP, but for the sake of ensuring as much consistency with the PTRM as possible we have not amended this calculation in our modelling.
 - Secondly the effect of this PTRM treatment is that it becomes possible that negative powers of incentive (i.e. there is an incentive on the TNSP to spend above its regulatory target) will arise under both the AEMC and AER incentives. This counter-intuitive result comes about because of the six month gap in the PTRM's revenue calculations between when assets enter the RAB and when depreciation on the asset begins. Such counter-intuitive outcomes however occur only when the present value of the difference between target and actual expenditure is small.

The last significant regulatory algebra issue relates to the implementation of the AEMC's re-opener. This was described earlier in Appendix A 4.1 on key methodological issues, and Appendix A 4.5.

4.4. Definition of model outputs

The formal definition of the model outputs is as shown in Table 5 below. The last column provides a description of the meaning and use of this output in the analysis

Table 5. Definition of model outputs

Output	Definition	Meaning and use
Present value of overspend / underspend	This is the present value (discounted at the pre-tax vanilla WACC) of the difference between the initial five year capex target specified by asset category and the actual five year capex, specified by asset category.	This gives the value of the underlying difference between target and actual expenditure. It represents the total additional cost (overspend) or saving (underspend) compared to the regulatory target, that the TNSP and its customers will share.
Present value of loss / profit pre-tax	For each of the AER and AEMC this is the difference in the present values of the revenue stream based on the initial regulatory capex targets and their respective calculation of the regulatory income stream over the life of the assets, less the revenue stream that would arise based on actual expenditure.	This is the profit/loss that the TNSP derives on any underspend/overspend measured against the regulatory capex targets. It should be noted that TNSPs can generate a profit even though there is an overspend. This is attributable to the six month delay between the recognition of an asset in the RAB and its depreciation (see discussion above). More significantly this outcome can also arise under the AEMC's incentive after a reopener. For example if a TNSP underspends against the revised target it obtains a profit across the regulatory period even though it will have spent above its initial regulatory targets.
Power of incentive pre-tax	This is the present value of loss/profit pre-tax divided by the present value of the overspend/underspend.	This measures (pre-tax) the value of the difference between actual and target expenditure that is retained by TNSPs.
Power of incentive post-tax	This is the present value of loss / profit pre-tax multiplied by 1 minus the marginal corporate income tax rate if the present value of pre-tax loss/ profit is greater than zero. If the present value of pre-tax loss / profits is less than zero then the post-tax power of incentive and pre-tax power of incentive are the same.	This measures (post-tax) the value of the difference between actual and target expenditure that is retained by TNSPs.

Output	Definition	Meaning and use
Change to return on assets	This is the annualised value of the ratio of the present value of the loss/profit post tax at the start of the regulatory period carried forward (at the WACC) to the end of the regulatory period and then divided by the closing RAB plus the depreciated value of actual expenditure (using actual depreciation in the case of the AER and regulatory depreciation in the case of the AEMC). The annualised value is expressed as a Compound Annual Growth Rate (CAGR) to reflect the effect of compounding.	This expresses the impact of post tax profit/losses under the capex incentive as an annual rate of return on the regulatory asset base.

4.5. Design of the Monte Carlo model

We developed a Monte Carlo simulation model to calculate the probability distribution of financial outcomes under both the AER and AEMC capex regimes. This sub-section describes the architecture of this model. It focuses on how the two uncertain variables: actual capital expenditure; and whether and if so when the initial capex targets are reset, is modelled.

The model is developed in Microsoft Excel using its random number generator. VBA code was written to automate the Monte Carlo simulation.

4.5.1. Modelling actual capex

The capital expenditure targets for each year, and for the modelled asset categories, are known at the commencement of the regulatory period. The actual capital expenditure during the regulatory period is uncertain. To model this uncertainty, the actual annual capital expenditures are defined as random variables within the Monte Carlo simulation.

The random variable is assumed to have a normal distribution, where the mean of the distribution is defined as a percentage offset from the target capex, and the variance of the distribution is defined as a percentage of the target capex. The value of the variable with these statistical properties across the distribution is provided through the “Rand()” function in Excel.

We have assumed independent random variables for expenditure in each year of the period. While some level of temporal dependence may actually occur (i.e. expenditure may be deferred or brought forward within the regulatory period) it would be difficult to

objectively model this. At the least a more detailed project-level capex model would be needed. We do not consider that the additional complexity of this form of model would materially impact the overall conclusions in this report, and as such we have not attempted to model this dependence.

The capex model also assumes that the breakdown of actual capex in any year remains in the same asset category proportion as the target capex. This reflects our view that actual capex by asset category is likely to generally maintain the proportions set in the target. For completeness however, in the development of the model we did assess whether modelling capex by asset category as independent random variables had any effect. While the probability distribution of outcomes was wider the median was largely unchanged, as would be expected.

4.5.2. Modelling the AEMC re-opener mechanism

For the AER capex incentive, the known initial capex targets and the random model representing the actual capex, are sufficient to assess the incentive properties of this scheme.

The AEMC capex incentive allows for the capex targets to be re-set during the regulatory period. This re-opener can have a significant impact on incentive properties. Considerable additional complexity in the Monte Carlo model is required in order to objectively simulate the occurrence and outcome of re-opener events. This sub-section sets out our understanding of the practical implementation of the re-opener, and then describes how this has been modelled in our Monte Carlo simulation. As described in the body of the report we sought advice from ACCC lawyers on the appropriate interpretation of the re-opener set out in the Draft Rules, and our modelling of the reopener reflects that advice.

Our modelling reflects the understanding that a TNSP can apply for the cap to be re-opened if the total capex required to operate the system safely and reliably during the period is expected (by the TNSP) to exceed the target capex, and provided that the TNSP can identify a project (any project) whose total expenditure is greater than 5% of the opening RAB. Furthermore, expenditure on that project can occur over two or more regulatory periods (i.e. the 5% of RAB requirement does not relate to expenditure during the regulatory period to be re-opened).

It is very likely that all TNSPs will always have at least one project exceeding the 5% RAB threshold within their capital expenditure programme. Therefore it is likely that the re-opener conditions will be satisfied if a TNSP can argue that it is reasonably likely that the total actual capex during the regulatory period will exceed the target capex. In other words, a TNSP can apply and its application must be granted, if at any time during the regulatory period its reasonable estimate of the sum of the actual capex incurred up to the time of the application plus the expected capex from this time to the end of the regulatory period, will be above the original targets.

It is very likely that all TNSPs will always have at least one project exceeding the 5% RAB threshold within their capital expenditure programme. Therefore it is likely that the re-opener conditions will be satisfied if a TNSP can argue that it is reasonably likely that the total actual capex during the regulatory period will exceed the target capex. In other words, a TNSP can apply and its application must be granted, if at any time during the regulatory period its reasonable estimate of the sum of the actual capex incurred up to the time of the application plus the capex from this time to the end of the regulatory period, will be above the original targets.

Revised capex targets following the re-opening must then be set so that the sum of the annual capex targets during the period (original targets up to and including the year of the re-opening plus the revised targets thereafter) will equal the TNSP's estimate of the total actual capex during the period.

In order to simulate this re-opener mechanism within the Monte Carlo model, random variables are used to generate a revised mid-term capex forecast. The probabilistic model of this revised mid-term capex forecast is equivalent to the actual capex random model described above, however the mean and variance are set independently from the actual capex model.

The following is a description of the steps taken in each iteration of the Monte Carlo model to simulate the re-opening mechanism as defined above.

<p>Stage 1 - Generate an outcome for the capex forecasts.</p>	<p>Generate an outcome of the 5 year capex random models for:</p> <ul style="list-style-type: none"> • Actual capex; and • Revised mid term capex forecast
<p>Stage 2 – Determine if re-opener occurs</p>	<p>Check if in any year during the 5 year regulatory period the best estimate of the total capex will be greater than the total of the original target.</p> <p>The <i>best estimate</i> for year y is defined as the sum of the actual capex outcomes from year 1 up to and including year y plus the sum of the revised mid term capex forecast from year $y+1$ to the end of the period (year 5).</p> <p>Should the above criteria be satisfied then the re-opener year is defined as the year that the <i>best estimate</i> was at its greatest value.</p>
<p>Stage 3 – If re-opened, calculate revised targets.</p>	<p>If Stage 2 has determined that a re-opener event will occur in year y, then the revised targets from year $y+1$ to the end of the period are set as the revised mid term capex forecast for these years plus an adjustment to account for the difference between the original targets and the actual capex outcome from year 1 up to and including year y.</p>

	Note: Step 2 and 3 mean that a re-open event can only occur in years 1 to 4, and revised targets can only be set for years 2 to 5.
Stage 4 – Pass capex targets and actual capex to AER and AEMC revenue models.	<p>The original targets and the actual capex outcome (generated in Stage 1) is passed to the AER revenue model.</p> <p>For the AEMC revenue model, if a re-opener has not occurred then the 5 year target capex is set as the original targets. If a re-open event has been determined in Stage 2, then the 5 year capex targets are the original targets up to and including the re-opener year with the remaining targets being those determined in Stage 3. These 5 year targets and the actual capex outcome are passed to the AEMC revenue model.</p>
Stage 5 – Perform next Monte Carlo iteration	Return to Stage 1 to generate a new set of capex outcomes and repeat stages

5. Appendix B: Tables of results

This Appendix contains summary tables of the base data inputs and output results of the Monte Carlo Revenue Model simulations discussed in the main body of the report.

Table B-1 show the base input data used for each TNSP. This data is based upon the values from the data sources identified in Table 4.

Tables B-2, B-3 and B-4 show Monte Carlo model inputs and results across all the TNSPs for the three scenarios (expected actual capex = target capex; expected actual capex 15% below target capex; and expected actual capex 15% above target capex) presented in Section 2 of the main body of the report.

- Tables B-2a, B-3a and B-4a are actual capex and mid term revised forecast mean and standard deviation parameters used to generate the results in the Monte Carlo simulations.
- Tables B-2b, B-3b and B-4b are the summary results tables generated by the models from the above inputs. The input tables show the values of all relevant inputs and the output tables show, for all six of the TNSPs, the 10th percentile, median and 90th percentile values of the present value of the overspend / underspend, and the corresponding present value of the profit/loss to the TNSP (pre- tax), the power of the incentive (pre-tax), and the profit/loss to the TNSP (post -tax) as an annualised rate of return on regulated assets.

Table B-1 show the base input data used for each TNSP

	Real pre-tax vanilla WACC	Marginal tax rate	RAB at start of regulatory period	Remain. asset life	Equity / Total capital	Proportion of capex target by asset class					Capex target at start of regulatory period				
						Very long life (+ 50 years)	Long life (30-50 years)	Medium life (10-30 years)	Short life (1-10 years)	Undepreciated	Year 1	Year 2	Year 3	Year 4	Year 5
Electranet	6.06%	30%	\$ 824.00	29	28%	34%	35%	23%	5%	2%	\$ 68.20	\$ 87.80	\$ 78.60	\$ 68.60	\$ 45.40
Energy Australia	6.79%	30%	\$ 628.32	24.6	40%	22%	62%	15%	0%	1%	\$ 41.06	\$ 27.06	\$ 39.90	\$ 37.55	\$ 36.44
Powerlink	6.36%	30%	\$ 2,277.00	27	51%	37%	45%	11%	6%	2%	\$ 178.86	\$ 187.22	\$ 229.40	\$ 198.78	\$ 91.01
SP Ausnet	6.06%	30%	\$ 1,836.00	27	33%	3%	58%	31%	8%	0%	\$ 72.96	\$ 68.34	\$ 57.62	\$ 79.72	\$ 82.39
Transend	6.06%	30%	\$ 604.00	25	94%	32%	50%	11%	6%	0%	\$ 77.50	\$ 50.20	\$ 82.90	\$ 39.10	\$ 32.70
TransGrid	6.79%	30%	\$ 3,013.00	27	50%	15%	66%	4%	7%	7%	\$ 153.57	\$ 181.28	\$ 218.55	\$ 345.28	\$ 289.11

Table B-2a Expected actual capex equal to target capex – Monte Carlo inputs

	Mean % (reduction from original target)					Standard Deviation %				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Actual capex	0%	0%	0%	0%	0%	30%	30%	30%	30%	30%
Mid term revised forecast	0%	0%	0%	0%	0%	25%	25%	25%	25%	25%

Table B-2b Expected actual capex equal to target capex – Monte Carlo results

Revenue model metrics		Electranet		Energy Australia		Powerlink		SP Ausnet		Transend		TransGrid	
		AER	AEMC	AER	AEMC	AER	AEMC	- AER	- AEMC	AER	AEMC	AER	AEMC
PV of (overspend) / underspend [\$m]	10%	-\$ 46.1	-\$ 46.1	-\$ 24.1	-\$ 24.1	-\$ 119.2	-\$ 119.2	-\$ 46.6	-\$ 46.6	-\$ 39.4	-\$ 39.4	-\$ 150.7	-\$ 150.7
	Median	-\$ 0.4	-\$ 0.4	-\$ 0.2	-\$ 0.2	\$ 0.6	\$ 0.6	-\$ 0.3	-\$ 0.3	\$ 0.8	\$ 0.8	-\$ 1.7	-\$ 1.7
	90%	\$ 45.3	\$ 45.3	\$ 22.6	\$ 22.6	\$ 115.8	\$ 115.8	\$ 47.5	\$ 47.5	\$ 38.3	\$ 38.3	\$ 144.8	\$ 144.8
PV (loss)/ profit pre-tax [\$m]	10%	-\$ 11.4	-\$ 4.7	-\$ 5.7	-\$ 3.0	-\$ 29.2	-\$ 12.7	-\$ 11.6	-\$ 4.9	-\$ 10.8	-\$ 4.8	-\$ 30.3	-\$ 13.4
	Median	-\$ 0.0	\$ 0.8	\$ 0.0	\$ 0.4	-\$ 0.1	\$ 2.2	\$ 0.2	\$ 0.8	\$ 0.1	\$ 0.7	-\$ 0.2	\$ 2.7
	90%	\$ 11.5	\$ 7.7	\$ 5.3	\$ 4.1	\$ 29.0	\$ 20.3	\$ 11.7	\$ 7.4	\$ 10.8	\$ 7.3	\$ 29.1	\$ 20.7
Power of incentive pre-tax	10%	-6.4%	-11.0%	-11.6%	-13.2%	-2.4%	-10.0%	-15.5%	-13.2%	-3.5%	-9.0%	-15.1%	-15.4%
	Median	23.6%	12.4%	20.9%	12.2%	23.5%	13.1%	21.7%	10.8%	25.6%	13.9%	17.0%	8.8%
	90%	58.7%	34.5%	56.1%	38.2%	51.9%	32.5%	59.2%	31.9%	52.6%	33.2%	49.4%	30.6%
Change to Return on Assets (post tax)	10%	-0.30%	-0.12%	-0.23%	-0.12%	-0.29%	-0.13%	-0.17%	-0.07%	-0.38%	-0.17%	-0.23%	-0.10%
	Median	0.00%	0.02%	0.00%	0.01%	0.00%	0.02%	0.00%	0.01%	0.00%	0.02%	0.00%	0.01%
	90%	0.22%	0.15%	0.16%	0.12%	0.22%	0.15%	0.12%	0.08%	0.29%	0.19%	0.16%	0.12%

Table B-3a Expected actual capex 15% below target capex – Monte Carlo inputs

	Mean % (reduction from original target)					Standard Deviation %				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Actual capex	15%	15%	15%	15%	15%	30%	30%	30%	30%	30%
Mid term revised forecast	0%	0%	0%	0%	0%	25%	25%	25%	25%	25%

Table B-3b Expected actual capex 15% below target capex – Monte Carlo results

Revenue model metrics		Electranet	Electranet	Energy	Energy	Powerlink	Powerlink	SP Ausnet	SP Ausnet	Transend	Transend	TransGrid	TransGrid
		AER	AEMC	Australia - AER	Australia - AEMC	AER	AEMC	- AER	- AEMC	AER	AEMC	AER	AEMC
PV of (overspend) / underspend [\$m]	10%	\$ 5.1	\$ 5.1	\$ 3.4	\$ 3.4	\$ 10.2	\$ 10.2	\$ 8.2	\$ 8.2	\$ 4.8	\$ 4.8	\$ 23.1	\$ 23.1
	Median	\$ 45.5	\$ 45.5	\$ 23.8	\$ 23.8	\$ 115.6	\$ 115.6	\$ 46.5	\$ 46.5	\$ 38.1	\$ 38.1	\$ 148.1	\$ 148.1
	90%	\$ 85.5	\$ 85.5	\$ 43.5	\$ 43.5	\$ 217.4	\$ 217.4	\$ 86.9	\$ 86.9	\$ 70.8	\$ 70.8	\$ 275.6	\$ 275.6
PV (loss)/ profit pre-tax [\$m]	10%	-\$ 0.4	\$ 3.6	\$ 0.1	\$ 1.5	-\$ 1.6	\$ 9.0	\$ 0.3	\$ 2.9	\$ 0.0	\$ 2.3	\$ 2.9	\$ 11.9
	Median	\$ 9.9	\$ 7.5	\$ 4.8	\$ 3.9	\$ 25.5	\$ 19.8	\$ 9.8	\$ 6.9	\$ 8.7	\$ 6.3	\$ 28.4	\$ 22.1
	90%	\$ 20.0	\$ 13.5	\$ 9.5	\$ 7.3	\$ 51.1	\$ 35.6	\$ 19.8	\$ 12.5	\$ 17.5	\$ 11.9	\$ 51.6	\$ 37.0
Power of incentive pre-tax	10%	9.8%	8.4%	6.7%	7.5%	9.6%	6.7%	5.9%	5.9%	10.3%	6.7%	6.8%	6.5%
	Median	22.0%	15.8%	20.3%	16.2%	22.3%	16.2%	21.4%	14.3%	23.2%	16.2%	18.1%	14.0%
	90%	32.9%	33.8%	32.3%	33.0%	33.8%	34.8%	36.3%	30.7%	33.5%	30.9%	32.2%	31.7%
Change to Return on Assets (post tax)	10%	-0.01%	0.07%	0.00%	0.04%	-0.02%	0.07%	0.00%	0.03%	0.00%	0.06%	0.02%	0.07%
	Median	0.19%	0.15%	0.14%	0.12%	0.19%	0.15%	0.10%	0.07%	0.23%	0.17%	0.16%	0.13%
	90%	0.40%	0.28%	0.29%	0.23%	0.39%	0.28%	0.21%	0.14%	0.48%	0.33%	0.30%	0.22%

Table B-4a Expected actual capex 15% above target capex – Monte Carlo inputs

	Mean % (reduction from original target)					Standard Deviation %				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Actual capex	-15%	-15%	-15%	-15%	-15%	30%	30%	30%	30%	30%
Mid term revised forecast	0%	0%	0%	0%	0%	25%	25%	25%	25%	25%

Table B-4b Expected actual capex 15% above target capex – Monte Carlo results

Revenue model metrics		Electranet	Electranet	Energy	Energy	Powerlink	Powerlink	SP Ausnet	SP Ausnet	Transend	Transend	TransGrid	TransGrid
		AER	AEMC	Australia - AER	Australia - AEMC	AER	AEMC	- AER	- AEMC	AER	AEMC	AER	AEMC
PV of (overspend) / underspend [\$m]	10%	-\$ 98.1	-\$ 98.1	-\$ 50.4	-\$ 50.4	-\$ 251.2	-\$ 251.2	-\$ 101.7	-\$ 101.7	-\$ 82.4	-\$ 82.4	-\$ 313.3	-\$ 313.3
	Median	-\$ 46.9	-\$ 46.9	-\$ 23.7	-\$ 23.7	-\$ 116.4	-\$ 116.4	-\$ 49.1	-\$ 49.1	-\$ 36.9	-\$ 36.9	-\$ 150.1	-\$ 150.1
	90%	\$ 9.9	\$ 9.9	\$ 2.8	\$ 2.8	\$ 12.9	\$ 12.9	\$ 5.4	\$ 5.4	\$ 7.5	\$ 7.5	\$ 18.3	\$ 18.3
PV (loss)/ profit pre-tax [\$m]	10%	-\$ 23.4	-\$ 13.5	-\$ 11.1	-\$ 7.3	-\$ 60.0	-\$ 35.8	-\$ 23.2	-\$ 12.7	-\$ 20.5	-\$ 12.2	-\$ 60.6	-\$ 36.3
	Median	-\$ 10.0	-\$ 5.7	-\$ 4.7	-\$ 3.1	-\$ 26.2	-\$ 15.3	-\$ 10.2	-\$ 5.4	-\$ 8.5	-\$ 5.0	-\$ 26.8	-\$ 16.1
	90%	\$ 3.6	\$ 2.4	\$ 1.8	\$ 1.4	\$ 7.1	\$ 5.4	\$ 3.5	\$ 2.2	\$ 3.2	\$ 2.2	\$ 5.8	\$ 4.4
Power of incentive pre-tax	10%	6.2%	3.1%	0.6%	-0.9%	3.8%	1.2%	1.3%	-0.1%	8.1%	4.1%	-0.4%	-0.5%
	Median	22.5%	13.1%	20.5%	13.5%	22.3%	13.3%	21.3%	11.7%	23.9%	14.1%	17.7%	10.6%
	90%	39.6%	24.8%	40.1%	29.1%	36.8%	23.6%	40.9%	23.8%	39.5%	24.9%	37.4%	25.0%
Change to Return on Assets (post tax)	10%	-0.58%	-0.33%	-0.43%	-0.28%	-0.56%	-0.33%	-0.33%	-0.18%	-0.69%	-0.40%	-0.44%	-0.26%
	Median	-0.26%	-0.15%	-0.19%	-0.12%	-0.26%	-0.15%	-0.14%	-0.08%	-0.29%	-0.17%	-0.20%	-0.12%
	90%	0.07%	0.05%	0.05%	0.04%	0.05%	0.04%	0.04%	0.02%	0.08%	0.06%	0.03%	0.02%

**THE INCENTIVE IMPLICATIONS OF THE DRAFT NATIONAL ELECTRICITY AMENDMENT
(ECONOMIC REGULATION OF TRANSMISSION SERVICES) RULE 2006**

Darryl Biggar

9 March 2006

1. This document seeks to understand and comment on the incentive implications of the regulatory regime set out in the document “Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006”.
2. The key conclusions of this paper are as follows:
 - All of the incentive properties of any given implementation of the building block model can be determined by knowledge of the precise form of the building block equations used (that is, the precise form of the revenue equation and the asset-base roll-forward equation). Drawing on the draft rules and the associated report it is possible to construct, to a large extent, the precise form the building block model equations implied by the new rules. The rules leave some discretion to the AER in the design of the efficiency carry-over mechanism and the service standards incentive mechanism, subject to certain constraints set out in the rules.
 - The draft rules leave to the AER the task of designing the service standards incentive scheme, subject only to the limitation that the financial reward or penalty associated with the service standards scheme should not exceed 1% of the annual revenue. The 1% cap on the financial reward or penalty under the service standards incentive is too low, for two reasons: First the financial reward or penalty associated with the expenditure efficiency incentive is likely to exceed 1% of revenue. This gives rise to unbalanced incentives to cut expenditure, since the financial reward from a cut in expenditure may well exceed the financial penalty from a drop in service standards. Second, considering the service standards incentive alone, the size of the penalty required to induce adequate control of large adverse service standards events may well exceed 1% of revenue. The cap should be eliminated, or, if retained, it should be much larger, at around 10% of revenue.
 - The draft rules establish a regime in which there is a fixed, pre-determined, and relatively weak (but not zero) incentive to reduce capital expenditure. The incentive to reduce capital expenditure is limited to the real return on any capital under-spend. The power of this incentive is likely to be in the region of 6-8%. Unlike the arrangements in the AER’s current SRP, this incentive is constant over the course of the regulatory period and independent of the age of the assets involved. As is common, this low-powered incentive to reduce capital expenditure is coupled with limits on the discretion of the regulated firm – in this case, a prudency test on new capital expenditure. However it is not clear that the wording of the prudency test allows the regulator to penalize inefficient projects or, even if it can do so, that it will be able to prevent those projects being carried out in an inefficient manner. It is possible to simultaneously restore the incentive to forecast the costs of capex projects efficiently for the purpose of the regulatory test and ensure that those projects are carried out efficiently by rolling in to the asset base only a proportion of the amount

by which the out-turn cost of a project exceeds the cost forecast for the purpose of the regulatory test.

- The draft rules specify that the combined effect of the mechanism for establishing the forecast operating expenditure and the efficiency benefit sharing scheme must be such as to achieve a constant (“equal”) incentive to reduce operating expenditure in each year. The draft rules do not specify precisely what power of the incentive to reduce operating expenditure should be chosen. In principle it is possible for the AER to design this mechanism so as to achieve any desired power of the incentive to reduce operating expenditure.
- In regard to other, secondary incentives, the regime creates strong incentives to minimize tax expenditure and weak incentives to maximise the selling price of asset disposals. The draft rules do not mention the need for an unders-and-overs mechanism to adjust for the difference between forecast and out-turn revenue. But such a mechanism is presumably implicit in the concept of a revenue cap (which is required under the rules).
- In order for the AER to design an overall regulatory regime which meets the NEM objective, it will almost certainly be necessary for the AER to be able to choose a higher power for opex and service standards incentives than the power of the incentive to reduce capex specified in the draft rules, and to adjust the power of those incentives in the light of experience over time. Putting to one side the 1%-of-revenue cap on the service-standards incentive, the ability of the AER to choose a higher power for opex and service standard incentives will depend on the extent to which the AER can effectively prevent imprudent or inefficient capital investment.
 - If the AER can effectively prevent imprudent investment (which remains to be seen) it will be able to increase the power of the incentive on opex and service standards without fear of substitution from opex to capex or fear of creating incentives to increase service quality beyond an efficient level. The AER will also be able to adjust the power of the incentive in the light of new information and improvements in its regulatory skills over time.
 - On the other hand, if the AER cannot effectively prevent imprudent investment over-investment, the AER will not be able to increase the power of the incentive to reduce opex or increase the power of the incentive to improve service standards. This would be a significant limitation on the discretion of the AER. It is difficult to see, in this case, how this regime would achieve the overall NEM objective.

Introduction

3. The AEMC has put out for consultation a set of amendments to the rules governing the economic regulation of Transmission Network Service Providers (“TNSPs”). The new rules would replace the existing chapter 6 of the National Electricity Rules. The purpose of this paper is to understand and comment on the implications of the new rules for the incentives on regulated TNSPs.

4. This paper will not comment on all of the possible incentive implications of the new rules. For example, the new rules introduce a propose-respond regulatory process, under which the AER must accept a TNSP’s forecasts of future opex and capex, if the AER determines that those forecasts are a reasonable estimate of the TNSP’s required expenditure,

taking into account a number of factors. These new rules may have incentive implications, but I will not discuss these incentive effects here. Instead I will focus on the traditional “core” incentives of the regulatory regime – that is, the incentives on capital expenditure, operating expenditure and service standards.

Background

5. In analyzing the incentive implications of the draft rules, what should we be looking for? To answer this question it is necessary to briefly review the principles of incentive regulation.

6. In designing a regulatory regime, a regulator must make two key decisions: how much discretion to leave to the regulated firm; and the “power” of the incentive on each of the three key incentives: the incentive to reduce operating expenditure, the incentive to reduce capital expenditure, and the incentive to maintain or enhance or service standards.

7. The “power” of an incentive is a measure the strength of the incentive on the management of a regulated firm to pursue a particular objective. The power of an incentive depends on the share of the gains from pursuing that objective which accrue to the regulated firm. If a regulator keeps all of the benefit of a particular objective it can be said to have a high-powered incentive to pursue that objective. For example, if a regulated firm keeps \$1 for every \$1 reduction in expenditure, the firm would normally be said to have a “high-powered” incentive to reduce expenditure.

8. In designing an overall incentive framework there are a number of key principles which must be borne in mind.¹ One of these is the need for balance at the margin between the power of the different incentives. A high-powered incentive to reduce expenditure, for example, coupled with a weak incentive to maintain service standards will induce the regulated firm to cut expenditure at this risk of major failures in the quality of delivered services. A high-powered incentive to cut operating expenditure coupled with a weak incentive to cut capital expenditure will induce the regulated firm to change its capitalization policies so as to shift operating expenditure to capital expenditure, or to shift to more capital-intensive (and less inefficient) means of production.

9. The need for balance means that the power of the incentive to, say, reduce expenditure, can be no higher than the power of the incentive on the regulated firm to, say, maintain or enhance service quality. If we have low-powered incentives to maintain service quality then we must also have low-powered incentives to reduce expenditure, or risk the problems mentioned above. If we have low-powered incentives to reduce capital expenditure then we must also have low-powered incentives to reduce operating expenditure, or, again, risk the problems mentioned above.

10. In some cases, rather than rely exclusive on broad financial incentives, the regulator might choose to limit the discretion of the regulated firm. For example, rather than relying exclusively on broad incentives to maintain or improve service quality, the firm might be subject to certain minimum quality-of-service obligations which penalize the firm if standards drop below a predefined level. TNSPs, in fact, are subject to statutory reliability obligations which specify the standards to which networks must be constructed and operated. If such rules are effectively enforced, the firm will be deterred from cutting service quality, even in the face of higher-powered incentives to cut expenditure.²

¹ See “Key principles of incentive regulation”, *Network*, a publication of the ACCC, 2005.

² Conversely, however, the firm will not have an incentive to raise service quality even if it is socially-beneficial to do so.

11. Similarly, rather than relying on broad incentives to cut capital expenditure, the regulator might choose to limit the discretion of the regulated firm over the projects it chooses, or how much it spends on each project, perhaps through an ex-post prudency assessment of the decisions of the regulated firm. If this control on capital over-spending is effective, the firm will be deterred from inefficiently raising its capital expenditure even in the face of a high-powered incentive to raise service quality.³

12. Such controls on the regulated firm are usually associated with low-powered incentives. This is one reason why low-powered incentives are sometimes said to involve “intrusive” oversight of the regulated firm. On the other hand, in the presence of higher-powered incentives, the regulator can leave more discretion in the hands of the regulated firm, relying on broad financial incentives to induce the firm to use that discretion beneficially.

13. Economic theory does not allow us to assert that higher-powered incentives are always better. We have already seen one reason why – the need for balance implies that a low-powered incentive on one dimension must be balanced by low powered incentives on other dimensions. More generally, a high-powered incentive imposes greater risk on the regulated firm, and may not be sustainable. Instead, the optimal choice of the power of the incentive will balance factors such as the quality of the information available to the regulator, the risk aversion of the regulated firm, and the responsiveness of the firm to incentives.

14. Obtaining the right mix of controls versus discretion and the right balance of incentives on different objectives remains more of an art than a science. These components of a regulatory regime must be adjusted over time in the light of experience, new information, developments in the regulatory regime, changes in technology, and changes in the skills/experience of the regulator in obtaining and processing information.

15. To return to the question asked above: In analyzing the incentive implications of the draft rules, what should we be looking for? We would like to answer the following questions:

- Can we determine from the draft rules the power of the incentive to pursue different objectives, including the three key objectives of reducing operating expenditure, reducing capital expenditure and increasing service quality?
- To what extent and in what areas does the proposed regime rely on controls versus allowing the regulated firm discretion?
- Are these different incentive powers broadly balanced? Is the overall power of the incentive reasonable? Is the regulator in a position to adjust the power of the incentives in the light of developments and experience, over time?

The Form of the Building Block Model

16. As I have argued elsewhere⁴, the incentive implications of a regulatory regime can be determined by examining the precise form of the two key equations of the building block model: the revenue equation and the asset base equation. The draft rules are quite detailed – they specify in great detail, using legal terminology, the form of these two key equations of the building block model. Drawing on the rules – and with a small amount of judgment – it is

³ Again, conversely, the firm will have no incentive to cut capital expenditure if the existing service quality is higher than is efficient.

⁴ See “Incentive regulation and the building block model”, September 2004.

possible to reconstruct the form of the building block model implied by the AEMC in the new rules, and therefore to deduce the incentive implications of the proposed regulatory regime.

17. Sections 6.2.2 (a) and 6.2.1 (d) set out the form of the revenue equation. In my view, the language set out in the rules is best expressed in the following mathematical equation:

$$\hat{R}_t = r_t^N K_{t-1} - i_t K_{t-1} + \hat{D}_t + \hat{O}_t + \hat{T}_t + \hat{C}_t + S_{t-1} + P_{t-1} + F_{t-1}$$

Where

- \hat{R}_t is the forecast revenue (known in the rules as the *annual building block revenue requirement*).⁵
- $r_t^N K_{t-1}$ is the return on capital calculated in accordance with section 6.2.4. The return on capital is the product of the allowed nominal rate of return r_t^N and the value of the regulatory asset base at the beginning of period t , K_{t-1} .
- $i_t K_{t-1}$ is referred to as an “indexation of the RAB ... comprising a negative adjustment equal to the amount referred to in clause 6.2.3 (g) (4)”. Clause 6.2.3 (g)(4) specifies that the RAB is increased each period by an amount “necessary to maintain the real value of the RAB ... by adjusting that value for inflation”. This implies that the RAB must be increased by an amount equal to $i_t K_{t-1}$.⁶
- \hat{D}_t is the forecast depreciation calculated, as set out in section 6.2.5, in accordance with the depreciation schedules nominated by the TNSP, on the basis of a forecast capital expenditure profile.
- \hat{O}_t is the forecast operating expenditure (either as proposed by the TNSP as in clause 6.2.7(b) or as determined by the AER as in clause 6.16.2(b)(3)).
- \hat{T}_t is the forecast corporate income tax calculated in accordance with clause 6.2.9.
- \hat{C}_t is compensation for risks that are not otherwise compensated, including stranding risk (referred to in clause 6.2.3(f)).
- P_{t-1} is the amount of any cost pass-throughs calculated in accordance with clause 6.2.14.
- S_{t-1} is the amount of any reward or penalty under the operation of a *service target performance incentive scheme* calculated in accordance with section 6.2.10.
- F_{t-1} is the amount of any reward or penalty under the operation of an *efficiency benefit sharing scheme* calculated in accordance with section 6.2.8. Since the efficiency benefit sharing scheme relates only to operating expenditure, the function F_{t-1} is a function only of past out-turn and forecast opex (from the previous regulatory period).

18. Sections 6.2.3 (c) (4), 6.2.3 (g) and 6.2.3 (h) describe the form of the asset-base roll-forward equation. In my view, the language in these sections is best expressed in the following form of the asset-base roll-forward equation:

⁵ The rules distinguish the *maximum allowed revenue* from the *annual building block revenue requirement* but clause 6.2.1(b)(1) specifies that the present value of the maximum allowed revenue must be equal to the present value of the annual building block revenue requirement, so these two terms are equivalent for the purposes of this paper.

⁶ As will be seen later, this term is offset by a corresponding term in the asset-base roll-forward equation and therefore has absolutely no impact whatsoever. It should be deleted.

$$K_t = K_{t-1} + i_t K_{t-1} + I_t - \hat{D}_t - A_t + B_t^{IN} - B_t^{OUT} - r_t^R (I_t - \hat{I}_t)$$

Where:

- K_t is the value of the RAB as at the end of the regulatory control period t (or year, according to the time period in consideration).
- $i_t K_{t-1}$ is the indexation of the RAB mentioned above “necessary to maintain the real value of the RAB ... by adjusting that value for inflation” as mentioned above and as set out in clause 6.2.3(g)(4).
- I_t is the out-turn capital expenditure (clause 6.2.3(c)(4)(i)) less any out-turn expenditure which is not deemed to be prudent (clause 6.2.3(c)(4)(ii)).
- \hat{D}_t is the forecast depreciation as allowed for at the beginning of the period.
- A_t is the out-turn value of the revenue from any asset disposals during the period.
- B_t^{OUT} is the value of any assets which the AER is removing from the asset base (because the assets are no longer required, i.e., stranded) as set out in 6.2.3(c)(4)(viii).
- B_t^{IN} is the amount of any assets which the AER is allowing back in to the asset base (because previously removed assets are now required or expenditure which was previously deemed to be imprudent is now deemed to be prudent and efficient) as set out in 6.2.3(c)(4)(ix).
- $r_t^R (I_t - \hat{I}_t)$ is a term which relates to the incentives on over-or under-spending on capital expenditure, as discussed in the paragraphs which follow. r_t^R is the real rate of return in period t and $(I_t - \hat{I}_t)$ is the difference between the forecast and out-turn capex in period t .

19. This last term is worth discussing further. The rules state, in clause 6.2.3(h) that where the capital expenditure for a regulatory year is “greater than the forecast capital expenditure for that regulatory year ... the value of the regulatory asset base must not be increased for the foregone real return on capital as a result of that difference”, and similarly for any capital under-spend. It is possible that this requirement could be interpreted mathematically in different ways. For the purposes of this paper I will make the simplest possible assumption – that this implies an adjustment to the asset-base roll-forward equation of precisely the amount of the foregone real return on the over-spend or under-spend, which is: $r_t^R (I_t - \hat{I}_t)$.

20. These equations contain a lot of terms. For simplicity and clarity it is useful to focus on those terms which are important for determining the primary incentives. Specifically, let's put to one side compensation for risk \hat{C}_t , cost pass-throughs P_{t-1} , and assets brought into and out of the RAB B_t^{OUT} and B_t^{IN} . There are incentive implications of these terms, but these incentive implications are not central to the concerns of this paper.

21. The incentive properties of a regulatory regime depend on how the economic profit of the regulated firm varies with effort directed by the management of the regulated firm towards various ends. Therefore we need to calculate the economic profit of a firm subject to the regulatory regime described by the two equations above. The economic profit of a firm in a given period is equal to:

$$\pi_t = (R_t - I_t - O_t - T_t + A_t) + K_t - (1 + r_t^N)K_{t-1}$$

Where

π_t is the economic or “excess” profit of the firm in period t .

R_t is the out-turn revenue of the regulated firm.

O_t is the out-turn operating expenditure.

T_t is the out-turn tax expenditure.

And all other variables have the definition given above.

22. Using the equations above we find that:

$$K_t = K_{t-1} + I_t - (\hat{R}_t - r_t^N K_{t-1} - \hat{O}_t - \hat{T}_t - S_{t-1} - F_{t-1}) - A_t - r_t^R (I_t - \hat{I}_t)$$

And hence:

$$\begin{aligned} \pi_t &= (R_t - O_t - T_t) - (\hat{R}_t - \hat{O}_t - \hat{T}_t - S_{t-1} - F_{t-1}) - r_t^R (I_t - \hat{I}_t) \\ &= (R_t - \hat{R}_t) - (O_t - \hat{O}_t) - (T_t - \hat{T}_t) - r_t^R (I_t - \hat{I}_t) + S_{t-1} + F_{t-1} \end{aligned}$$

23. From this expression we can directly infer certain incentive implications. I first discuss the “secondary” incentive issues – the “primary” incentive issues relating to opex, capex and service standards, will be addressed in the next section. From the expression above we can immediately deduce the following:

- Since the firm keeps \$1 in profit for each \$1 reduction in out-turn tax (as can be seen in the term $(T_t - \hat{T}_t)$), the firm has a high-powered incentive to reduce its tax payment. This seems to be what is intended by the AEMC. The AEMC states: “The Commission considers that the benchmark approach to calculating the cost of tax should be continued, in order to provide an incentive for TNSPs to try to minimise their tax costs (e.g., by adopting a more tax efficient capital structure than the assumed benchmark). The direct calculation of a TNSP’s tax costs would be highly complex, and would remove any incentive for TNSPs to adopt more efficient capital structures”⁷.
- Since the firm keeps \$1 in profit for each \$1 increase in out-turn revenue (as can be seen in the term $(R_t - \hat{R}_t)$), the firm has a high-powered incentive to increase its revenue. However, in practice this incentive is offset by the unders-and-overs mechanism which offsets any over-recovery of revenue in one period by a corresponding under-recovery in the next and vice versa. The draft rules make no mention of such a mechanism, although its use is implicit in the concept of the revenue cap and therefore could be taken to be implied. Given the detail included in the rules it is perhaps surprising that an unders-and-overs mechanism is not mentioned.
- Since the firm receives no benefit from any increase in revenue from disposals, the firm has no incentive to actively seek to obtain a “good price” for any asset disposals. The associated report makes no mention of asset disposals so it is not possible to be certain that this incentive was intended by the AEMC. The draft rules merely refer to the “disposal value” of an asset without specifying whether this is the “forecast” or “out-turn” disposal value. The draft rules could, in principle, create high-powered

⁷ Page 67, AEMC, “Review of the Electricity Transmission Revenue and Pricing Rules: Transmission Revenue: Rule Proposal Report”, February 2006.

incentives to obtain the best price for asset disposals by inserting the word “forecast” before the word “disposal” in section 6.2.3(c)(4)(vii).

Service standards incentives

24. We obviously cannot say anything concrete about the nature of the service standards incentive without knowing something about the precise form of the “service target performance incentive scheme” denoted S_{t-1} in the expression above. The draft rules do not specify the form of this function, instead leaving this to be determined by the AER (clause 6.2.10(a)). Presumably the AER could design this function so as to achieve the power or form of the incentive that it desired.

25. However, the draft rules specify an upper limit on the amount of the revenue adjustment resulting from the operation of the service standards incentive scheme, limiting this to plus-or-minus 1% of the allowed revenue of the regulated firm. The AEMC is seeking comment on whether or not this is an appropriate limit. There are two issues which have a bearing on the magnitude of this limit:

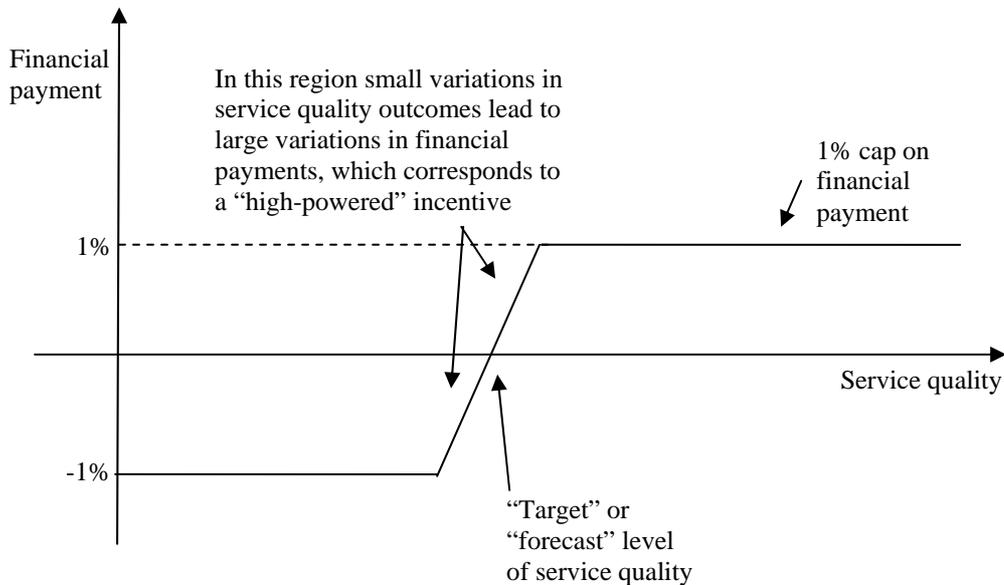
- First, if the ceiling on the financial penalty available under the service standards incentive is too low relative to the incentive to reduce capital expenditure or operating expenditure, there is a risk that the regulated firm might have an incentive to make large cuts in capex or opex, even when doing so threatens service quality. In fact, the firm will do so whenever the financial reward for the resulting expenditure “efficiency” exceeds the maximum 1% penalty for the resulting decline in service standards. The solution is either to increase the ceiling on the service standards incentive payments or to impose a corresponding 1% ceiling on the combined capex and opex efficiency incentive payments.
- Second, the size of the financial penalty or reward for service standards outcomes should be linked to the willingness of consumers to pay for service quality improvements (or how much they would accept to permit service quality deterioration). There are plausible scenarios in which the likely financial penalty or reward for service standards significantly exceeds 1% of the TNSP’s annual revenue. Under a 1%-of-revenue cap, there is a risk that the regulated firm might take action to protect against minor deterioration in service quality but not against the risk of a large failure to deliver services.

26. These issues are discussed further below. First, it is useful to clarify a potential confusion about the impact of a 1% cap on the power of the incentive to maintain service standards. In particular, the 1% cap on the financial payments of the service standards scheme does not necessarily constrain the power of the incentive under the service standards scheme. It is possible to have a high-powered incentive under a low cap. Conversely, it is possible to have a low-powered incentive with a much higher cap.

27. The power of the incentive under the service standards scheme depends on the sensitivity (in mathematical terms, the “slope”) of the financial reward or penalty to changes in service quality outcomes. Small changes in service quality outcomes may lead to large changes in financial rewards or penalties, even under a 1%-of-revenue cap. However, once the 1% cap has been reached, the power of the incentive for further improvements in service quality (or the power of the incentive to prevent further deterioration in service quality) drops to zero. This is illustrated in the following diagram.

28. The impact of the cap on incentives therefore depends on *both* the level of the cap and the size of the change in service quality. For small changes in service quality, the imposition of a cap may have little or no impact on the incentives of the firm. However, for large changes in service quality, the imposition of a cap may significantly weaken the incentives on the firm. As we will see, this gives rise to a situation where a firm may have strong incentives to prevent minor service quality changes while retaining little or no incentive to prevent major outages.

Figure 1: The interaction between the 1% cap and the power of the service quality incentive



Comparing incentives on service standards and expenditure

29. Earlier in this paper I mentioned the importance of “balance”, at the margin, between the power of the different incentives on the regulated firm. In particular, there is, of course, a need to ensure that the power of the incentive to maintain service quality is balanced with the power of the incentive to reduce expenditure.

30. However, when there is a ceiling on the financial reward or penalty available under the service standards incentive scheme, there is a “discontinuity” in the power of the incentive to make further improvements or prevent further deteriorations in service quality.⁸ In this circumstance, there is a need to check for balance, not just at the margin (i.e., for small variations in the likely expenditure and service standards performance of the firm) but also for large changes in the expenditure or service standards performance of the firm. In particular, we need to check that for large decreases in expenditure, the likely financial reward from the opex and capex efficiency incentive does not exceed the 1%-of-revenue ceiling on the service standards incentive.

31. The following table illustrates this problem using a hypothetical model of a service standards incentives with typical representative levels for the total expenditure drawn from the TransGrid 2004-2009 revenue cap decision of the ACCC/AER. Over this regulatory

⁸ In particular, in the case where the ceiling on the financial reward is reached, the power of the incentive to make further improvements in service standards drops to zero. In the case where the ceiling on the maximum financial penalty is reached the incentive to prevent further deteriorations in service standards drops to zero.

period the total forecast expenditure of TransGrid (the sum of capex and opex) is \$1974 million. The total allowed revenue is \$2414 million. Therefore, the ceiling on the payments under the service standards mechanism over this period is \$24.1 million.

32. The power of the expenditure efficiency incentive mechanism in this example was arbitrarily chosen to be 15% - a rather low-powered incentive for expenditure efficiency. As can be seen in the following table, the hypothetical service standards incentive mechanism has been chosen to be balanced with this incentive for expenditure efficiency for small changes in expenditure. For small reductions in total expenditure around the target level of \$1972.2 million, the firm receives an expenditure efficiency reward, but the cut in expenditure leads to a decline in service quality, which leads to a service quality penalty. Overall the TNSP is made worse off by any small cut in expenditure which also cuts service quality.⁹

33. However, importantly, this incentive reverses for larger cuts in expenditure which lead to larger reductions in service quality. As soon as the ceiling on the service standards incentive payment is reached (at \$24.1 million), further cuts in expenditure increase the net profit of the TNSP by 15 cents in the dollar. As the following table shows, in this example even a relative modest cut in total expenditure of 10% leaves the TNSP better off, and even bigger cuts leave the TNSP even better off.

Table 1: A cap on payments under the service standards scheme can produce undesirable incentives to make large reductions in expenditure

Change in expenditure	Total expenditure	Expenditure efficiency incentive payment (15%)	Service standards incentive payment	Net benefit to the TNSP
104%	\$2,053.1	-\$11.8	\$11.6	-\$0.2
100%	\$1,974.2	\$0.0	\$0.0	\$0.0
98%	\$1,934.7	\$5.9	-\$6.9	-\$0.9
96%	\$1,895.2	\$11.8	-\$14.4	-\$2.6
94%	\$1,855.7	\$17.8	-\$22.7	-\$4.9
92%	\$1,816.2	\$23.7	-\$24.1	-\$0.5
90%	\$1,776.8	\$29.6	-\$24.1	\$5.5
88%	\$1,737.3	\$35.5	-\$24.1	\$11.4
86%	\$1,697.8	\$41.5	-\$24.1	\$17.3
84%	\$1,658.3	\$47.4	-\$24.1	\$23.2

34. The solution to this problem is straightforward. The maximum permissible financial reward or penalty associated with the service standards incentive must be in line with the largest likely financial reward or penalty associated with the expenditure efficiency incentive. If, through the expenditure efficiency incentive, the firm can, for large variations in expenditure, earn a financial reward equal to x% of revenue then the cap on the service standards incentive must itself be at least equal to x% of revenue. Conversely (but less desirably) if the service standards incentive is capped at 1% of revenue, the expenditure efficiency incentive must itself be capped at 1% of revenue.

35. What is the maximum likely financial reward or penalty for an expenditure efficiency incentive under the regulatory regime set out in the draft rules? This depends on both the largest likely variation in expenditure and the largest likely power of the incentive.

⁹ And conversely, any small increase in expenditure which improves service quality.

36. As discussed below, the draft rules specify a low-powered incentive on capital expenditure equal to the foregone real return on capital. This limits the power of the capex incentive to around 6-8%. As we will see later, the draft rules allow the AER discretion over the design of the opex incentive. In practice the AER is unlikely to choose a power of the opex incentive to be more than around 40%. Let's assume that opex is one third of the total expenditure (as it is in the TransGrid 2004-2009 revenue cap decision). If we assume that the maximum likely variation in expenditure is 30% we find that the maximum likely financial reward or penalty under the regulatory regime set out in the draft rules is likely to be around 5.5% of the total allowed revenue.¹⁰

37. 5.5% of the total allowed revenue is not a particularly large value. However, it is clearly significantly larger than the plus-or-minus 1% ceiling proposed by the AEMC. The experience with the Essential Services Commission in Victoria is that service standard rewards or penalties in the last regulatory period can easily amount to 2.5% of revenue. The power of this incentive has subsequently been enhanced in the next regulatory period, so the financial penalties could be even larger in the future.

Will a 1% cap on service standards yield adequate incentives to promote service quality?

38. As noted earlier, there is another reason why a ceiling of plus-or-minus 1% might not yield an adequate incentive. It makes sense to measure the power of the service standards incentive as the fraction (at the margin) of the change in total economic welfare arising from a change in service standards. The economic welfare arising from a change in service standards is the amount that consumers value that change – that is, the amount they are willing to pay for an improvement in service quality or the amount they are willing to accept as compensation for a decline in service quality.

39. Is it the case therefore that for a reasonable power of the service standard incentive, the financial penalty or reward could reasonably be expected to exceed 1% of revenues?

40. The answer seems to be yes. Let's consider the economic cost of a large-but-not-entirely-unreasonable loss of supply event. Specifically, suppose that some failure of the transmission system in NSW caused the loss of electricity supply to 20% of the total customers in the state for a period of 10 hours. This would amount to a sizeable black-out, but not one that is so large as to be incredible. Let's conservatively value that load to those customers at \$10,000 per MWh (VENCorp, for planning purposes, uses the much higher figure of \$29,600/MWh). The total cost of this blackout is around \$158 million per occurrence.¹¹ If we assume that the power of the service standards incentive is around 25%, then the total financial penalty to the TNSP would be \$39.6 million. This comfortably exceeds 1% of the allowed revenue for TransGrid (which we saw above is \$24.1 million).

41. To make matters even worse, the 1% cap on the service standards incentive scheme is applied not on the total revenue earned over the regulatory period but on the revenue earned in any one year. This would limit the financial penalty in the case above to an amount closer to \$4.8 million.

42. In other words, it appears that there are some credible scenarios in which the total financial penalty around a reasonable service standards incentive scheme substantially exceeds 1% of revenues in either one year or one regulatory period. The 1% cap on financial

¹⁰ One third of 8% times 30% plus two-thirds of 40% times 30% is 5.5% of the total forecast expenditure which I am assuming is roughly the same as the total allowed revenue.

¹¹ This assumes an average daily consumption in NSW of around 190 GWh. The loss of 8.33% of this amount, valued at \$10,000/MWh is \$158 million.

penalty will reduce the incentive on the TNSP to prevent these scenarios, raising the risk of a catastrophic service outage, even if the TNSP simultaneously retains incentives to prevent minor deteriorations in service quality.

43. As already suggested, if a TNSP has a reduced incentive to control for certain scenarios, this could, in principle, be offset by tinkering with the power of the expenditure-efficiency incentive. However, the problem here is that only some service standards events are large enough to be affected by the cap. The TNSP may have adequate incentives to control for small events (where the financial penalty from the service standards incentive is less than the cap) but, at the same time, may have inadequate incentives to control for large events (where the financial penalty from the service standards incentive is larger than the cap).

44. To solve this problem the cap should be larger than the largest financial penalty associated with the largest reasonable change in service quality. If we assume a maximum power of the service standards incentive of 40% and if we take the blackout above as a worst-case scenario (which causes harm equal to 6.5% of revenue over the regulatory period), the cap on the service standards incentive scheme should be at least 2.6% of revenue over the regulatory period¹². If the cap is to be applied annually, the cap on the service standards incentive should be at least 13.1% of annual revenue.

45. These numbers are, of course, only indicative. A credible argument could, perhaps, be made for even higher levels of the cap. The key point here is that a cap on the maximum financial penalty under the service standards incentive of 1% appears to be too small by as much as one order of magnitude.

46. It should also be noted that TNSPs have existing statutory obligations to maintain given levels of reliability. These vary from jurisdiction to jurisdiction. It is unclear precisely how “binding” these obligations are on the TNSPs (and, in any case, this will vary from jurisdiction to jurisdiction). If these obligations provide a strong constraint on the actions of TNSPs it might be expected that, even if the service-standard incentive mechanism were weak, TNSPs would not allow reliability standards to slip. At this stage, the adequacy of these obligations is unclear.

47. Finally, it should also be noted that, of course, the incentive to promote service standards should also be balanced with the incentive to promote safety. Apparently, employees of network companies have complained that incentives to promote service quality have increased the pressure to carry out “live-line working”, increasing the risk of accidents. Clearly, if we do not want service standards to be promoted at the expense of employee safety, it is important to ensure that safety incentives are adequate or reinforced at the time that service standards incentives are increased.

Capital expenditure efficiency incentives

48. Let’s turn now to look at the implications of the draft rules for capital expenditure incentives. When it comes to capital expenditure, a regulator would like to simultaneously create incentives to (a) choose the most efficient projects; (b) carry out those projects at the correct time; and (c) implement the projects in a way which incurs the least cost. These objectives are obviously inter-related and are part of the broader objective to deliver the desired levels of service using the least amount of expenditure.

¹² Since 40% of 6.5% is 2.6%.

49. Let's focus for the moment on the incentive to reduce capital expenditure. To say something concrete about the incentive to reduce capital expenditure implied by this regime, we need to explicitly consider a multi-year regulatory period and specify precisely how out-turn information will be taken into account when determining forecasts for the subsequent regulatory period. Since this makes the analysis a little more technical, the mathematics involved has been relegated to the appendix.

50. I will make the important assumption that the required level of capital expenditure in one period is independent of the required level of capital expenditure in another period so that information about the level of capital expenditure of the firm in the immediate past sheds no light on the likely level of capital expenditure required in the present regulatory period. This implies that the capex out-turn in one regulatory period will have no impact on the capex forecast in the subsequent regulatory period.

51. This is a strong and questionable assumption. It could be that certain forms of capital expenditure are on-going and therefore information that the firm achieved, say, a 20% reduction in that expenditure in the past could provide useful information about the likely expenditure requirement in the future. On the contrary, if capital expenditure occurs in "waves" it could be that a high level of capital expenditure in the past is more likely to be associated with a low level of capital expenditure in the present. However, this assumption is a useful starting point and a useful point of distinction from opex, where we will assume that the opex out-turn in the immediate past provides direct and useful information on the likely opex out-turn in the present.

52. I show in the appendix that under this assumption, the power of the incentive to reduce capital expenditure in each period is constant and equal to the real return on capital.

53. There are several points we can make about this incentive:

- First, the incentive to reduce capital expenditure is low-powered. If the real WACC is, say, 6%, the TNSP only retains 6 cents for every \$1 of savings on capital expenditure (and vice-versa for over-spend). The low-powered nature of this incentive is apparently intended by the AEMC, which comments: "The difficulties with forecasting future capital requirements, which may be highly uncertain, particularly towards the end of the regulatory period, and the fact that capital expenditure is typically of a 'lumpy' nature, means that providing a more high-powered incentive regime for capital expenditure risks inappropriately rewarding TNSPs for differences between actual and forecast outcomes that are not in fact related to efficiencies".¹³

As I have argued earlier, low-powered incentives are not necessarily undesirable, however, it is normal and appropriate for low-powered incentives to be supplemented by controls on the discretion of the regulated firm. The AEMC proposal limits the discretion of the regulated firm by allowing the AER to deny the inclusion in the asset base of any capital expenditure which it determines is not prudent. There is no corresponding power which allows the AER to penalize the firm for not undertaking an investment which the AER determines is prudent, although this may not be necessary. The implications of the prudence test are discussed further below.¹⁴

¹³ Page 84.

¹⁴ Some TNSPs are arguing that the prudence review should be applied only when the out-turn capex total exceeds the capex forecast. Under this rule the firm would have little incentive to choose efficient projects, or to carry out projects efficiently, as long as it was clear there was little risk of the total capex out-turn exceeding the target. This seems undesirable.

A secondary benefit of a low-powered incentive is that the regulated firm has only a weak incentive to strive to induce the AER to over-state its forecast capital expenditure requirement. As noted above, if the real WACC is 6%, the firm retains only 6 cents for every \$1 which it is able to induce the AER to raise its forecast capital expenditure.

- Second, if the real return on capital is constant over the course of the regulatory period, the incentive to reduce capital expenditure is constant over the course of the regulatory period and independent of the precise nature of the capital expenditure. This could be contrasted with the approach in the AER's SRP under which the incentive to reduce capital expenditure varies with the asset life; and reduces as the end of the period approaches.¹⁵ The AEMC recognizes this issue with the SRP approach, noting that "by incorporating depreciation into the incentive regime, a TNSP is rewarded (penalized) most for under- (over-)spending on short-lived assets. ... This provides an incentive for TNSPs to shift the allocation of reported actual capital expenditure away from short-lived assets ... and towards long-lived assets".¹⁶
- Third, to the extent that the regulated firm is able to shift capital expenditure within the regulatory period, the regulated firm will have some (relatively weak) incentive to defer all capital expenditure to the last year of the regulatory period. To see this, suppose that the regulated firm can defer \$1m of capex from the first year of the regulatory period to the last year of the regulatory period by reducing its capex in year 1 by \$1m and increasing its capex in year 5 by \$1m. If the real WACC is constant at 6%, the firm increases its profit in year 1 by \$60,000, but reduces its profit in year 5 by \$60,000. But since \$1 in year 5 is worth only 75% of \$1 in year 1 (assuming 6% WACC), the overall increase in the profit of the firm is \$15,000. This incentive to defer capex until the end of the regulatory period is not unique to this regime and will, in fact, arise under virtually any reasonable incentive arrangements.

It is also worth noting that, conversely, the regulated firm will have some (relatively weak) incentive to shift its forecast capex program to the early years of the regulatory period for exactly the same reason.

- Fourth, the incentive to reduce capital expenditure is the same whether or not the forecast capex allowance is a simple quantity, fixed in advance, or whether the forecast capex allowance depends on events which may occur during the regulatory period¹⁷. For example, some TNSPs have argued that the forecast capex allowance should not be a simple fixed quantity but should depend on certain exogenous events, such as whether or not a large "point load" (such as an aluminium smelter) is constructed. These are known in the current jargon as "contingent projects". The incentive on the TNSP to reduce its capital expenditure is the same whether or not the forecast capex allowance is fixed, or is contingent on the carrying out of certain projects.

In the same way, the forecast capex allowance could be made to depend on external factors (such as the price of aluminium or copper, or on exchange rates) with no necessary impact on the incentives of the firm to reduce its overall capital expenditure.

¹⁵ See "Understanding capex incentives", February 2005.

¹⁶ Page 84-85.

¹⁷ Strictly speaking, provided the forecast capex allowance does not depend on the capex decisions of the regulated firm

54. As mentioned above, the draft rules explicitly require a low-powered incentive to reduce capital expenditure. In the absence of any further controls, this would raise the risk of the regulated firm (a) selecting inefficient projects; and (b) failing to implement those projects in a manner which minimizes the overall cost. This risk is particularly real in the event that the allowed cost of capital exceeds the firm's "true" cost of capital. In such a world the firm has an incentive to expand its capital base, virtually indefinitely, since every additional \$1 of asset base increases its "true" profit by more than \$1.

55. To address this risk, the draft rules require that the regulator not roll into the regulatory asset base capital expenditure which is determined not to be prudent or efficient (clause 6.2.3(c)(4)(ii)). In determining whether expenditure was prudent or efficient the AER "must only take into account information and analysis that the TNSP could reasonably be expected to have considered or undertaken at the time that it undertook the relevant capital expenditure" (clause 6.2.4(d)).

56. At first sight it makes sense for the regulator to be limited to only considering those facts which the firm knew (or should have known) at the time when the decision to undertake a project was taken (it would subject a firm to undue risk if a project which currently appears efficient later is deemed to be inefficient due to factors outside the control of the firm). But it is not clear that the prudence test as set out in the draft rules will limit the discretion of the regulated firm to choose projects which are inefficient or will induce the firm to implement those projects in a manner which minimizes overall cost, for the following reasons:

- First, what incentive does a TNSP have under this regime to accurately forecast the benefits or the costs of a project at the time it carries out the regulatory test cost-benefit analysis? Since the regulator can only take into account information considered by or analysis undertaken by the TNSP, will the TNSP undertake analysis or seek out information which might show that the benefits of the project are likely to be lower or the costs likely to be higher than currently estimated? If the regulator later produces evidence that the costs were likely to be higher than expected and that this could have been determined by the TNSP at low cost had it undertaken certain analysis would the regulator be able to penalize the regulated firm? It seems to me that there is a risk that TNSPs will be able to systematically underestimate the cost of their future projects.
- Second, even if the TNSP takes into account all available information at the time it makes the decision to go ahead with a project, what incentives are there on the TNSP to control the cost of the project? If the cost of the project later turns out to be higher than forecast, on what grounds could the regulator penalize the regulated firm? Since the out-turn cost of a project cannot be known with certainty at the time the decision to undertake a project is made, it is difficult to see how the regulator could exclude the cost over-run as imprudent or inefficient under the draft rules.

57. These two issues are inter-related. A firm does not have an incentive to correctly forecast the cost of a project for the purposes of the regulatory test if it does not pay some penalty for getting that cost wrong. In the same way, a firm does not have an incentive to ensure that a project is carried out at least cost unless it pays some penalty for cost over-runs.

58. My understanding is that VENCORP addresses both of these issues by simply requiring that a firm roll into the asset base the forecast cost used for establishing that a project passes the regulatory test. This rule simultaneously creates strong incentives for the regulated firm to accurately forecast the cost of the project for the purposes of the regulatory test (forecasting a cost too high reduces the likelihood that the project will pass the test; forecasting a cost too low increases the likelihood of cost over-runs) and creates strong incentives for the firm to ensure that the project is carried out at least cost.

59. Of course, other mechanisms are possible which would also restore some incentive on the regulated firm to correctly forecast the cost of a project and some incentive to minimize the cost of implementing a project. For example, consider the mechanism under which the regulator rolls in to the asset base the average of the forecast cost used for the purpose of the regulatory test and the out-turn cost of the project. Under this mechanism the regulated firm retains 50 cents for each \$1 of cost saving on the project, creating quite strong incentives to keep costs down, while still forecasting the cost accurately in the first place.

60. In summary, in the light of the weak incentives in the draft rules to control capital expenditure, it makes sense to limit the discretion of the regulated firm with regard to capital expenditure by subjecting that capital expenditure to an ex post prudency review. However, it is not clear that the draft rules will allow the regulator to penalize the regulated firm for inaccurate forecasts of the costs or benefits of the proposed project, or for implementing the project in an inefficient manner.

61. It is possible to simultaneously (a) limit the discretion of the firm over the projects that it chooses, and (b) ensure that the chosen projects are efficiently implemented by (a) requiring that all projects must pass the regulatory test; and (b) rolling in to the asset base an amount which is some combination of the forecast cost used for the purposes of the regulatory test and the out-turn cost.

62. It seems to me that, at a minimum, the draft rules should be modified so that (a) the regulator is only required to “have regard to” “the information and analysis that the TNSP could reasonably be expected to have considered or undertaken at the time that it undertook the relevant capital expenditure” and (b), in addition to being required to have regard to whether “the relevant project ... satisfied the regulatory test”, the regulator should be required to have regard to “the forecast cost used to assess whether or not the relevant project satisfied the regulatory test”. These changes might allow the regulator to deem as imprudent a proportion of the costs incurred in excess of the forecast cost used for the purpose of the regulatory test.

Operating expenditure efficiency incentives

63. Let’s turn now to the question of incentives to reduce operating expenditure. Unlike the case for capex, we can no longer assume that the opex out-turn in previous years will not have an impact on the forecast opex requirement in the current regulatory period.¹⁸ Let’s assume, therefore, that the forecast opex is a function of the out-turn opex in previous regulatory periods.

64. In this case it is possible to show that the power of the incentive depends on how the sum of the forecast opex and the efficiency benefit sharing scheme depends on the past opex out-turn. I show that it is possible to design either (a) the mechanism for setting forecast opex or (b) the efficiency benefit sharing scheme so as to achieve *any desired power* of the incentive to reduce operating expenditure.

65. As before, a couple of points are worth noting:

- First, the efficiency benefit sharing scheme is redundant when it comes to designing incentives. Any desired set of incentives can be achieved by designing the mechanism

¹⁸ Indeed, it is sometimes assumed that there is a one-to-one relationship between an increase in the opex out-turn in the previous regulatory period and an increase in the opex forecast in the subsequent regulatory period.

for setting forecast opex alone – there is no need for an efficiency benefit sharing scheme to achieve, say, constant incentives over time.

- Second, it is desirable for the forecast opex (or the sum of the forecast opex and the efficiency benefit sharing scheme) to depend on the opex out-turn in all years of the previous regulatory period. If the forecast opex is independent of the opex out-turn in one year, the firm can report any expenditure it wants in that year without having any impact whatsoever on future opex targets. As a result, the firm has no incentive to report its costs truthfully. In the past, when the opex targets were set exclusively on the basis of the cost out-turn in the last year of the previous regulatory period, the regulated firm has no incentive to report costs truthfully in the first four years of the regulatory period. This makes inter-firm comparisons or measurement of productivity trends difficult.

Overall incentive framework considerations

66. In brief, the proposed regime seems to provide (a) constant, weak incentives for reducing capital expenditure, supplemented with an ex-post prudency test of capex; (b) constant, but indeterminate, incentives for reducing operating expenditure; and (c) indeterminate (to be chosen by the AER) incentives for promoting service standards, subject to a 1% cap on the revenue at risk. What more can we say about the incentive properties of the proposed new regime overall?

67. The theory of incentive regulation suggests that the optimal power of the overall incentives depends, amongst other things, on the quality of the information available to the regulator. For example, the better the quality of the information obtained by the regulator about the effort of the regulated firm towards a particular objective, the more desirable is a high-powered incentive. But the information available to the regulator will vary widely from industry to industry, country to country, and from time to time. The information available to the regulator will depend on factors such as the number of comparator firms and the extent to which they are comparable with the firm in question. This will vary across industries and over time. As the regulator improves its skills in the collection and processing of information it should, in principle, move towards higher-powered incentive schemes. As the AER increases in the quantity and quality of information which it collects it may wish to move to a higher-powered incentive scheme.

68. Equally important, in practice, the impacts of different incentive mechanisms are difficult to predict and seldom fully understood in advance. It is often difficult to assess the ease with which the regulated firm can respond to incentives. The firm may develop new ways to respond to incentives which were not at first anticipated. It is difficult to know the importance of non-financial incentives and pressures such as pressures of public opinion or political pressure. Given these uncertainties, incentive regulation in practice is a heuristic process, requiring periodic adjustments to the incentives in the light of experience.

69. Therefore it is important to ask the question: “Does the AER have discretion under the new rules to choose a high-powered, or medium-powered incentive on opex efficiency or on service standards, if it sees fit to do so, and to adjust any such incentives in the light of experience and improvements in information?”

70. The answer seems to be that the ability of the AER to implement a high-powered or a medium-powered incentive on opex efficiency or on service standards will depend on the effectiveness with which the AER can deny imprudent capex. It will also depend on the significance of the 1% cap on the service-standards incentive. For simplicity let’s put that

issue to one side by assuming that the cap on the service-standards incentive has been increased or eliminated entirely.

71. As we have seen, high-powered incentives on opex, combined with low-powered incentives on capex (as we have in the draft rules) give rise to strong incentives on the regulated firm to substitute from operating expenditure to capital expenditure. The firm may be able to do this by inefficiently switching to more capital-intensive methods of production or by changing accounting policies to capitalize certain operating costs. This problem is recognized in the draft rules, which state in clause 6.2.8(a)(5) that in designing the efficiency benefit sharing scheme, the AER should have regard to “any incentives that TNSPs may have to inappropriately capitalize operating expenditure”. If the AER cannot effectively prevent this substitution from operating expenditure to capital expenditure, it will not be able to choose a high-powered or medium-powered incentive on opex efficiency.

72. Similarly, a high-powered or medium-powered incentive on service standards coupled with a low-powered incentive on capex would induce the firm to over-build the network. In principle, there is an efficient level of service quality at which point further expenditure on the network exceeds the value that users derive from the improvements in service quality. An imbalance in the incentives will induce the regulated firm to improve service quality above the efficient level. Again, if the AER cannot detect and prevent unnecessary capital expenditure it may not be able to choose a high-powered or medium-powered incentive on service standards.

73. If the AER were forced to adopt low-powered incentives on all three objectives – capex, opex and service standards, there would be a greater need for the AER to exercise oversight of all of the expenditure decisions of the regulated firm. The overall regime – which would then involve both ex post prudency assessment of the capital expenditure decisions of the firm and ex post assessment of the operating expenditure decisions of the firm – would inevitably be rather information intensive and intrusive. The AEMC has stated that “all other things being equal, it would be better to have a less intrusive regulatory approach rather than a more intensive regulatory approach”.¹⁹ It is difficult to see how such a regime would satisfy the overall NEM objective.

74. However, in contrast, if the AER is effectively able to control the capital expenditure decisions of the regulated firm the AER will retain some discretion in how it chooses to design the incentive regimes for opex and service standards. This discretion is important if the AER is to adjust the regime in the light of experience or improvements in the quality of information it collects.

Conclusion

75. We are now in a position to give tentative answers to the questions raised at the outset:

- *Can we determine from the draft rules the power of the incentive to pursue different objectives, including the three key objectives of reducing operating expenditure, reducing capital expenditure and increasing service quality?*

The AEMC’s draft rules are highly prescriptive while, at the same time, leaving the design of key incentives to the discretion of the AER. The rules are particularly prescriptive in relation to incentives for capital expenditure efficiency. Drawing on

¹⁹ Page 12.

the draft rules, and using a small amount of judgment, it is possible to determine the incentive properties implied by the draft rules.

In brief, the proposed regime seems to provide (a) constant, weak incentives for reducing capital expenditure, supplemented with an ex-post prudency test of capex; (b) constant, but indeterminate (to be chosen by the AER), incentives for reducing operating expenditure; and (c) indeterminate (to be chosen by the AER) incentives for promoting service standards, subject to a 1% cap on the revenue at risk.

- *To what extent and in what areas does the proposed regime rely on controls versus allowing the regulated firm discretion?*

The proposed regime relies on broad incentives (to be designed by the AER) for maintaining/promoting service quality and for ensuring incentives to reduce operating expenditure. The regime limits the discretion of the regulated firm with respect to capital expenditure by imposing an ex post prudency review of capex. However, this ex post review is limited in the nature of the information it can take into account and therefore may not effectively limit the discretion of the firm to choose inefficient projects. It also will not limit the discretion of the firm to implement projects inefficiently.

- *Are these different incentive powers broadly balanced? Is the overall power of the incentive reasonable? Is the regulator in a position to adjust the power of the incentives in the light of developments and experience, over time?*

The extent to which the prudency test is effective in practice will affect the ability of the AER to design other incentives. If the AER can effectively control capital expenditure (which is questionable), the AER will be able to implement a higher-powered incentive on operating expenditure, combined with a higher-powered on service standards incentive and to adjust the power of those incentives to better achieve the overall NEM objective over time.

On the other hand, if the AER cannot effectively control the incentive on the regulated firm to expand its capital expenditure, it will not be able to implement higher-powered incentives on opex or service standards. Higher-powered incentives on opex will induce the firm to capitalize opex and shift to inefficient capital-intensive production technologies. Higher powered incentives on service standards will induce the firm to increase service standards – even beyond a level which is efficient for the community as a whole.

The 1% cap on the financial reward or penalty under the service standards incentive is too low, for two reasons: First the financial reward or penalty associated with the expenditure efficiency incentive is likely to exceed 1% of revenue. This gives rise to unbalanced incentives to cut expenditure, since the financial reward from a cut in expenditure may well exceed the financial penalty from a drop in service standards. Second, considering the service standards incentive alone, the size of the penalty required to induce adequate control of large adverse service standards events may well exceed 1% of revenue. The cap should be eliminated, or, if retained, it should be much larger, at around 10% of revenue.

Appendix:

76. Let's put to one side the terms in the building block equations above relating to tax, revenue, and service standards.²⁰ The economic profit function for one period therefore reduces to:

$$\pi_t = -(O_t - \hat{O}_t) - r_t^R (I_t - \hat{I}_t) + F_{t-1}$$

77. It is straightforward to show that the value of the regulated firm (that is, the present value of the future payments to investors) is equal to:

$$V_t = K_{t-1} + PV_t^T(\pi)$$

Where:

V_t is the value of the firm at the beginning of period t and $PV_t^T(\pi)$ is the present value of the economic profit of the firm starting in period t , and finishing in period T , the last year of the life of the firm.

78. Under certain assumptions it is reasonable to define the power of an incentive to achieve an objective (such as a reduction in expenditure) as the sensitivity of the present value of the profit of the regulated firm to a change in the out-turn expenditure. Specifically the power of the incentive to reduce opex and capex can be defined as:

$$P_t^O = (1+r) \frac{\partial V_t}{\partial O_t}$$

And

$$P_t^I = (1+r_t) \frac{\partial V_t}{\partial I_t}$$

79. Mathematically, this assumption implies that the forecast capex (denoted \hat{I}_t) is independent of the capex out-turn (denoted I_t). Since, by assumption, the function F_{t-1} is independent of the forecast or out-turn capex we have the very simple result that the power of the incentive to reduce capital expenditure in each period is just equal to the real return on capital.

$$P_t^I = (1+r_t) \frac{\partial V_t}{\partial I_t} = \frac{\partial \pi_t}{\partial I_t} = -r_t^R$$

80. The draft rules specify that the regulatory period must be at least five years (clause 6.2.1(f)). For simplicity, let's assume a regulatory period of five years. Let's suppose that year 6 is the start of the second regulatory period. The forecast opex in years 6-10 is then assumed to be a function of the out-turn opex in years 1-5:

$$\hat{O}_6 = \hat{O}_6(O_1, O_2, \dots, O_5) \text{ and similarly for } \hat{O}_7, \hat{O}_8, \hat{O}_9 \text{ and } \hat{O}_{10}.$$

²⁰ In effect this amounts to assuming that the revenue, tax and service standards outcomes are equal to the forecast revenue, tax and service standards levels.

81. The opex incentives will also be affected by the precise nature of the efficiency benefit sharing scheme, represented by the function F_t . The amount added or subtracted from the allowed revenue in each year is a function *only* of the out-turn and forecast opex in the *previous* regulatory period. In other words:

$$F_6 = F_6(O_1, O_2, \dots, O_5, \hat{O}_1, \hat{O}_2, \dots, \hat{O}_5) \text{ and similarly for } F_7, F_8, F_9 \text{ and } F_{10}.$$

82. Using this information we can calculate that the power of the incentive to reduce the operating expenditure is:

$$P_t^O = (1 + r_t) \frac{\partial V_t}{\partial O_t} = -1 + \frac{1}{(1 + r)^{5-t}} \frac{\partial PV_6^{10}(\hat{O} + F)}{\partial O_t}$$

83. The precise form of the efficiency benefit sharing scheme is left to be determined by the AER. However, clause 6.2.8(a)(3) requires that the AER must have regard to the need to provide a “continuous incentive (that is equal in each year of any regulatory control period) to reduce operating expenditure”. Let’s suppose therefore that the AER chooses to provide a continuous incentive equal to the constant k , say. This implies that

$$P_t^O = -1 + \frac{1}{(1 + r)^{5-t}} \frac{\partial PV_6^{10}(\hat{O} + F)}{\partial O_t} = k \text{ for } t = 1, \dots, 5$$

84. As we can see, the power of the incentive to reduce opex depends on *both* the sensitivity of forecast opex to out-turn opex and the sensitivity of the efficiency benefit sharing scheme to out-turn opex.

85. It is possible to design either (a) the mechanism for setting forecast opex or (b) the efficiency benefit sharing scheme so as to achieve any desired power of the incentive to reduce operating expenditure. For example, suppose that the sum of the forecast opex and the efficiency benefit sharing scheme was chosen so as to satisfy the following equation:

$$PV_6^{10}(\hat{O} + F) = (1 + k)(1 + r)^5 \sum_{s=1}^5 \frac{O_s}{(1 + r)^s}$$

86. It is straightforward to verify that, in this case, the power of the incentive to reduce operating expenditure is just constant and equal to k as above.

**THE APPROPRIATE CREDIT RATING FOR AUSTRALIAN ELECTRICITY
TRANSMISSION BUSINESSES**

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EXECUTIVE SUMMARY

The Australian Energy Regulator (AER) has recently favoured a credit rating of A for Australian electricity transmission businesses along with a leverage ratio of 60%. By contrast the Australian Energy Markets Commission (AEMC) has more recently reviewed electricity transmission revenue and pricing rules in Australia and argued for a rating of BBB for electricity transmission businesses. This paper has analysed this issue and the conclusions are as follows.

The appropriate credit rating for *all* electricity transmission businesses should be that for a wholly privately owned business, and without any adjustment for conservatism as undertaken by a number of Australian regulators. Examination of the S&P ratings for transmission and distribution business, and using a regression approach, points to an estimated credit rating for a privately-owned electricity transmission business of A- at leverage of 60%. This estimate is subject to considerable statistical uncertainty, with the 95% confidence interval ranging from the A+/A boundary to the BBB+/BBB boundary. Nevertheless, the confidence interval includes the A rating favoured by the AER and excludes the BBB rating favoured by the AEMC. A less sophisticated approach yields a point estimate of at least A- but no confidence interval can be determined. Both approaches provide much stronger support for the AER's use of A than the AEMC's view of BBB. The same rating should be extended to government owned transmission businesses.

1. Introduction

The Australian Energy Regulator has recently favoured a credit rating of A for Australian electricity transmission businesses along with a leverage ratio of 60% (AER, 2005)¹. By contrast the Australian Energy Markets Commission has more recently reviewed electricity transmission revenue and pricing rules in Australia and argued for a rating of BBB for electricity transmission businesses (AEMC, 2006)². This paper seeks to analyse this issue and recommend an appropriate rating for Australian electricity transmission businesses consistent with a leverage of 60%.

2. Alternative Views

The AER's views in this area are most fully explained in a recent draft decision (AER, 2005). Table H.4 presents S&P ratings for all 10 Australian electricity transmission and distribution firms that have been rated, and this includes a number of wholly or partly government-owned entities. The average rating is almost A+ and the average gearing is close to 60%³. The AER acknowledges the upward bias from inclusion of government owned entities but argues that this effect is not large and counters the downward effect of distribution businesses. Prima facie, this analysis supports the AER's position.

Turning now to the AEMC (2006), they argue that the nature of ownership (public versus private) should not affect regulatory outcomes (i.e., regulated prices) and therefore ratings for publicly owned electricity transmitters should be disregarded. The AEMC goes on to state that its consideration of recent regulatory decisions and credit ratings for various energy network businesses leads to a rating of BBB. However they provide no detail in support of this conclusion. They do however state that the appropriate range is between BBB- and AAA, and their conclusion in favour

¹ It is not specified whose rating system is envisaged but this report assumes that S&P's system is being used.

² It seems clear from the context that a leverage ratio of 60% is presumed here also.

³ If one assigns the number 1 to an AA+, the number 2 to AA, the number 3 to AA-, the number 4 to A+, and so on, the average outcome over the ten firms is 4.1, corresponding to a rating of almost A+.

of a rating (BBB) that is close to the bottom of that range suggests that their choice is deliberately conservative.

This conclusion on the issue of conservatism is supported by a review of recent electricity decisions by state regulators. These all involve distribution rather than transmission businesses, but this is not relevant to the conservatism issue. The Queensland Competition Authority (2005) favours BBB+ for these businesses and cites a report from The Allen Consulting Group (2004) in support of this. The latter favours BBB+ but nevertheless views that as conservative. Their central estimate must then be excess of BBB+. The Essential Services Commission (2005) and the Essential Services Commission of South Australia (2005) also favour BBB+ for these businesses and again view this as conservative. So, again, their central estimates must be in excess of BBB+.

All of this suggests that there are at least two significant factors in drawing conclusions about the appropriate credit rating from observed ratings for relevant businesses. The first is the issue of private versus public ownership, and the second is the issue of whether estimates should be conservative. If publicly owned firms are disregarded, the average rating is likely to fall. If estimates are chosen to be conservative, the rating will fall again. We first address each of these points, and then turn to the data.

3. The Ownership Issue

Cursory examination of the evidence in AER (2005, Table H.4) reveals that publicly owned entities appear to have higher credit ratings than otherwise identical privately owned entities, and the reason is obvious. Publicly owned entities have a lower risk of default because their owners are more likely to rescue the entity in the event of financial difficulties.

To explore this issue, consider the following highly simplified example. An electricity transmission industry is characterised by two types of firms. Type A firms are publicly owned, have no risk of default and can therefore borrow at the government stock rate of 6%. In addition, such firms are fully debt funded so that

their cost of capital is 6%. All such firms have assets of \$1,000m and no other costs. So, an appropriate level of revenues would appear to be \$60m per year for each firm. Type B firms are identical except in being privately owned, and therefore at some risk of default. The probability of default is 1% and losses suffered by debt holders in that event would be the full \$1,000m invested. Accordingly, the cost of debt for such firms is 7% per year, with the additional 1% (i.e., \$10m per year) compensating debt holders for the expected default loss of \$10m per year. Since type B firms are also fully debt funded, their cost of capital is 7% per year, and therefore the appropriate revenues are \$70m per year for each firm.

Given this scenario, the controversial question is then as follows. For the purpose of setting the cost of debt of these firms, and therefore their regulated revenues, which of the following policies should be adopted?

- (1) Average over their costs of debt to yield a rate of something between 6% and 7% for all firms (the average will depend upon the relative numbers of firms in each category), or
- (2) Apply different rates depending upon ownership (6% for publicly owned firms of this type and 7% for privately owned ones), or
- (3) Apply the private sector rate of 7% for all such firms.

Policy (1) is not in my view viable, for two reasons. Firstly, it will apply a rate that is too low to private sector firms. For example, if the average rate is 6.4%, then the revenues obtained from customers will be only \$64m per year whereas their interest costs are \$70 per year. The firms will therefore be rapidly driven into bankruptcy, i.e., the revenues in even the first year will be insufficient to meet the interest payments required by debt holders. It will be of no comfort to these debt holders to be told that revenues of \$64m reflect the industry average situation, because such debt holders are not in the industry average situation; they are fully exposed to the possibility of default and require interest payments of \$70m to compensate them for it. Furthermore, if more of the firms in this industry become publicly owned, the average cost of debt will decline and thereby aggravate the problem here. The second difficulty with policy (1) lies in the cost of debt applied to the publicly owned firms. If the rate used is 6.4%, as above, this cannot be correct because the only two possibilities are 6% or 7%, with 6% applying if public ownership is considered to be

relevant and 7% if it is considered to be irrelevant.

Since policy (1) is not viable, this leaves either policy (2) or policy (3). To examine this matter more closely, suppose that a distress situation occurs, i.e., the businesses suffers a shock that reduces the value of its assets by \$1,000m and the taxpayer owners inject this sum to restore the business to its former condition. The owners may or may not seek to recover this \$1,000m by raising the firm's output prices. If they do seek recovery in this way, then the cost of debt that should be used to determine the firm's output price is no longer 6%. It is instead 6% in tranquil times and something considerably larger in the event of financial distress. To set the output price initially on the basis of a 6% cost of debt, but with the possibility of a subsequent substantial increase under certain conditions, raises significant problems of inter-generational equity. To avoid such difficulties, the appropriate course of action would be to act as if the publicly owned firms were privately owned and therefore faced the private sector cost of debt of 7%. This is policy (3).

On the other hand, if the owners of a publicly owned firm would not seek to recover the \$1,000m through higher prices in the event of financial distress, then the inter-generational equity problem still exists but is instead suffered by the taxpayer owners of the firm rather than its customers, i.e., taxpayers who live through a period without financial distress will not be required to contribute to the \$1,000m whereas those who do live through it will be required to do so. In view of this, the appropriate course of action would still be to avoid the inter-generational equity problem, and this can only be done through setting output prices to incorporate the future possibility of financial distress, i.e., to act as if the publicly owned firms were privately owned and therefore faced the private sector cost of debt of 7%. Again, this is policy (3).

In summary, three possible methods for setting the cost of debt for electricity transmission businesses exist. The first option will undermine the financial viability of privately owned firms through an insufficiently high cost of debt. The second option induces inter-generational equity problems for either the customers or the owners of the publicly owned firms. The third option is free of both problems, and is therefore recommended, i.e., apply the private sector cost of debt to all firms in the industry.

4. The Issue of Conservatism

As noted earlier, a number of state regulators have deliberately chosen ratings below their central estimate in the interests of being conservative, and the AEMC may have acted in the same way. The usual reason for conservative parameter choices is uncertainty over the correct value coupled with the more severe consequence of underestimating the output price (in the form of deterring investment) compared to overestimating it (in the form of unduly high prices to consumers). Furthermore, any practice involving conservative choice in the area of the cost of debt will flow through into other areas of output price setting.

I am entirely sympathetic to the argument in favour of conservatism, and have argued in favour of it elsewhere (Lally, 2005, section 9.1). However, the practice of applying conservatism at the level of each parameter, rather than to the output price resulting from a series of parameter estimates (or at least to the WACC), is to generate an output price that is not only very conservative but probably far more so than might be anticipated. Furthermore, the resulting degree of conservatism in the output price will not be transparent. To illustrate this point, suppose that the output price P is determined by adding together estimates of five parameters, i.e.,

$$P = X_1 + X_2 + X_3 + X_4 + X_5 \quad (1)$$

Suppose also that there is uncertainty over each of these parameters, i.e., the chosen values are drawings from normal distributions with means $E_1 \dots E_5$ and standard deviations $\sigma_1 \dots \sigma_5$ respectively. The means $E_1 \dots E_5$ are the true but unobservable values for each of the five parameters. Purely to facilitate demonstration of the point, suppose that the estimation errors in respect of the five parameters are independent. The sum of the five parameter values selected (P) will then also be normally distributed, with mean and standard deviation as follows.

$$E(P) = E_1 + E_2 + E_3 + E_4 + E_5$$

$$\sigma(P) = \sqrt{\sigma_1^2 + \sigma_2^2 + \sigma_3^2 + \sigma_4^2 + \sigma_5^2}$$

Again, to facilitate demonstration of the point, suppose that $E_1 \dots E_5$ are equal (and denoted E_x) and $\sigma_1 \dots \sigma_5$ are equal (and denoted σ_x). It follows that $E(P) = 5E_x$ and $\sigma(P) = \sqrt{5}\sigma_x$. So, the output price chosen (P) is a drawing from a normal probability distribution with mean $5E_x$ and standard deviation $\sqrt{5}\sigma_x$. The mean $5E_x$ is the appropriate output price, but this is unknown.

We can now consider the two possible approaches to this conservatism issue. Firstly, suppose conservatism is applied at the individual parameter level. In particular, we add some margin to the estimated value for each parameter so as to reduce the probability of the estimate being less than the true value to 16%. This could be called a mildly conservative margin. In respect of the first parameter, we then choose a margin m_1 , and therefore the estimate $X_1 + m_1$, so that

$$\Pr ob[X_1 + m_1 \leq E_1] = .16$$

Since X_1 is drawn from a normal distribution with mean E_1 and standard deviation σ_1 , then it can be represented as

$$X_1 = E_1 + \sigma_1 Z_1$$

where Z_1 is a drawing from the standard normal distribution. Substitution of this equation into its predecessor yields

$$\Pr ob[E_1 + \sigma_1 Z_1 + m_1 \leq E_1] = .16$$

and so

$$\Pr ob\left[Z_1 \leq \frac{-m_1}{\sigma_1}\right] = .16$$

By reference to the probability density function for Z_1 , it follows that the margin m_1 must be set equal to σ_1 . The same result holds for each of the other four parameter

estimates, i.e., the margin added to the estimated parameter value must be set equal to the standard deviation of the distribution from which the estimate is drawn. Since each of these standard deviations is the same (σ_x) then each of the margins should be the same (and is equal to σ_x).

We now consider the implications of this behaviour for the estimated output price. This is no longer given by equation (1) but by the addition of the margin σ_x to each of the five individual parameter estimates, and the resulting estimate for the output price is denoted P_m , i.e.,

$$P_m = P + 5\sigma_x = X_1 + X_2 + X_3 + X_4 + X_5 + 5\sigma_x \quad (2)$$

As noted previously, the variable P is normally distributed with mean $5E_x$ and standard deviation $\sqrt{5}\sigma_x$. It can therefore be represented as

$$P = 5E_x + \sqrt{5}\sigma_x Z \quad (3)$$

where Z is a drawing from the standard normal distribution. Using equations (2) and (3), the probability of the estimate P_m being less than its true value of $5E_x$ is then as follows.

$$\begin{aligned} \Pr ob[P_m \leq 5E_x] &= \Pr ob[P + 5\sigma_x \leq 5E_x] \\ &= \Pr ob[5E_x + \sqrt{5}\sigma_x Z + 5\sigma_x \leq 5E_x] \\ &= \Pr ob\left[Z \leq \frac{-5}{\sqrt{5}}\right] \end{aligned}$$

Reference to the probability density function for Z reveals that this probability is only 1.3%. This implies an extremely conservative estimate for the output price. So, adoption of mildly conservative estimates for each parameter (involving a 16% chance of the estimate being too low) induces an extremely conservative estimate for the output price (involving only a 1.3% chance of the estimate being too low). Had there been 10 individual parameters to estimate, and each was estimated so as to produce a 16% chance of being too low, the estimate for the output price would have had only a 0.1% chance of being too low. This would be extraordinarily conservative.

In view of all this, the correct approach to parameter uncertainty would be to estimate the output price without the addition of margins to each parameter, and then adjust that estimate to generate the desired level of protection against uncertainty. So, the output price would be estimated by adding a single margin to equation (1) rather than from equation (2). For example, if the margin (m) were chosen so that the probability of the estimate ($P + m$) being less than its true value was 16%, then m would be such that

$$\text{Pr ob}[P + m \leq 5E_x] = .16$$

Substituting equation (3) into this and solving for the margin m would yield the appropriate value. This margin would then ensure that the chance of the estimated output price being too low was 16% rather than 1.3% or 0.1%.

In summary, the adjustment of individual parameter estimates to incorporate uncertainty is inappropriate because it is likely to induce an estimate of the output price that is far more conservative than intended. Furthermore, the latter degree of conservatism would not be transparent.

5. Selecting the Appropriate Rating

Having resolved two preliminary issues, we can now return to the question of what is the appropriate credit rating for an Australian electricity transmission business. This will involve a wholly privately owned firm with leverage of 60% and free of any adjustments to reflect parameter uncertainty. An appropriate starting point would be the current S&P ratings for all Australian electricity transmission and distribution businesses. Since there are only two pure transmission businesses (SPI PowerNet and ElectraNet), and neither of them is wholly privately owned, the distribution businesses and the government owned businesses are added to increase the sample size and therefore the reliability of the estimate for a wholly privately owned pure transmission business with leverage of 60%. These firms are shown in Table 1, with their S&P

ratings and financial leverages obtained from Standard & Poors (2006), and their ownership and business type being supplied by the AER.⁴

Table 1: Australian Electricity Transmitters and Distributors

Firm	Rating	Owner	Business	Leverage
Ergon Energy	AA+	Govt	Dist	46%
Country Energy	AA	Govt	Dist	68%
Energy Australia	AA	Govt	Trans/Dist	52%
Integral Energy	AA	Govt	Dist	55%
SPI PowerNet	A+	Private/Govt	Trans	77%
SPI Australia	A+	Private/Govt	Dist	64%
Citipower Trust	A-	Private	Dist	54%
ETSA Utilities	A-	Private	Dist	64%
Powercor Australia	A-	Private	Dist	38%
ElectraNet	BBB+	Private/Govt	Trans	72%
United Energy	BBB	Private	Dist	80%

The effect of ownership upon ratings has already been noted. In respect of financial leverage, this raises default risk and should therefore lower the credit rating. In respect of transmission versus distribution, the latter should be subject to lower ratings on account of higher default risk and the explanations for this higher default risk are as follows. Firstly, distribution businesses are subject to price rather than revenue cap regulation, and therefore to greater volume risk. Secondly, some of the distribution businesses are bundled with retail operations, which are competitive and competition must raise the risk of default⁵. Thirdly, and unlike transmission businesses,

⁴ AGL is excluded because the firm is undergoing restructuring, and this may affect its long-term credit rating; inclusion of it does not materially change the results. In addition, the leverage values are book rather than market measures. Since S&P uses the former in assessing ratings, we use the same measure in seeking to explain the ratings. This conflicts with the leverage benchmark of 60% referred to earlier in this paper, which is defined in market value terms. However we do not seek to resolve this issue here. If the average book leverage matches the average market leverage, the issue evaporates.

⁵ In a competitive market, inefficiency leads to loss of customers. By contrast, inefficiency in a monopolistic market leads only to the possibility of some reduction in cash flow, contingent upon the

distribution businesses are confined to a particular state and therefore to the economic shocks of that state rather than a broader area; the latter risks are lower because they benefit from diversification across states. These arguments are consistent with the views expressed by Standard and Poors (2002).

In summary, we have ratings for eleven firms and three possible explanatory variables in the form of ownership (*OWN*), type of business (*BUS*) and leverage (*LEV*). The appropriate statistical model here is multiple regression, which requires numerical values for each variable. Evidence presented by the Essential Services Commission (2005, Tables 9.12 and 9.13) suggests that the cost of debt spreads between successive rating categories (A, A-, BBB+, etc) are similar. So, the numbers 1, 2...8 are assigned to the rating categories AA+, A, BBB. In addition, *OWN* is numerically expressed by assigning 0 to private ownership, 1 to government ownership and .50 for mixed ownership. In addition, *BUS* is numerically expressed by assigning 0 to transmission, 1 to distribution and .50 to a mixed business. Finally, *LEV* is measured as indicated in Table 1 less 60%. The model is then as follows.

$$RAT = a + b_1OWN + b_2BUS + b_3LEV + e$$

Having measured the variables *OWN*, *BUS* and *LEV* in the way indicated, the estimate for *a* is then the estimated rating for a privately owned pure transmission business with leverage of 60%. Preliminary analysis of the data reveals that the ElectraNet observation is a material outlier and therefore should be dropped. Running the regression then yields the following result

$$RAT = 5.99 - 4.56OWN + 0.47BUS + .035LEV \quad (4)$$

with the first two coefficients being statistically significant and that on *LEV* close to being so. Furthermore, the signs on all variables correspond to those anticipated by theory. Alternative models arise by considering various combinations of independent

regulator declining to allow pass-through of the higher costs. The default risk arising from the former situation is clearly greater. In the subsequent analysis, we do not distinguish between a pure distribution business and one with retail operations attached, on the grounds of being unable to quantify this.

variables and selecting the model with the highest adjusted R^2 through the “step-wise” process (Hanke and Wichern, 2005, Ch. 7)⁶. The best such model has only a slightly higher adjusted R^2 than for equation (4), but it deletes *BUS*. Since theory supports the inclusion of *BUS*, and the difference in adjusted R^2 is slight (.940 versus .936), equation (4) is then preferred. Using this model, the estimated rating for a private transmission company is the estimated intercept of $\hat{a} = 5.99$, which corresponds to a rating of A-.⁷ In respect of the 95% confidence interval on this estimate, the standard error on \hat{a} , and therefore on the estimated rating, is $s_{\hat{a}} = 0.65$ and the relevant t distribution is t_6 . So, the 95% confidence interval on the estimated rating is as follows.

$$\hat{a} \pm s_{\hat{a}} t_{6,0.975} = 5.99 \pm 0.65(2.447) = 5.99 \pm 1.59 = 4.40 \rightarrow 7.58$$

This corresponds to A+/A through to BBB+/BBB, i.e., from the boundary of A+/A through to the boundary of BBB+/BBB. This range includes the A rating favoured by the AER and excludes the BBB rating favoured by the AEMC.

A less sophisticated approach to this issue would be to simply average the S&P ratings for all four of the wholly privately owned distribution businesses. This yields an estimate for such businesses of 6.5, which implies a rating on the boundary of A-/BBB+. The average leverage of these four firms is very close to 60% and therefore no correction is required for leverage. However, since theory and the comments of S&P both point to a better rating for transmission than for distribution, then the appropriate rating for a privately owned transmission business at leverage of 60% would be at least A-. The subjective nature of any such adjustment for transmission versus distribution would preclude estimation of a confidence interval. This approach is statistically less satisfactory than use of a regression model but is more transparent.

⁶ These authors attach the generally advertised caveat relating to testing a large set of independent variables that lack theoretical justification: the more variables examined, the higher the risk of adding spurious ones to the final model. This concern does not arise above because the independent variables examined have theoretical support.

⁷ Equation (4) also implies an estimated rating for a privately owned distribution business of 6.46, which is on the boundary between A- and BBB+.

One final issue here is that rating differences for privately owned transmission businesses in part reflect uncontrollable differences across the firms⁸. Accordingly, even if all such businesses were subject to a notional leverage of 60% in setting their output prices, the application of a single rating category, and therefore a single cost of debt, *might* lead to some businesses being granted too high a cost of debt and others too low a cost of debt. Accordingly, it might be argued that the individual ratings of the rating agency should be assigned to the businesses. There are a number of difficulties with this suggestion. Firstly, none of the pure transmission businesses is wholly privately owned and therefore the ratings assigned by S&P would have to be corrected for that fact. Secondly, rating differences across firms at least partly reflect differences in efficiency and the task of a regulator is to improve efficiency through setting a benchmark rather than to sanction inefficient behaviour, i.e., regulation is incentive rather than cost based. Thirdly, ratings for individual firms are subject to some degree of assessment error, and averaging over the ratings of several firms generates a more reliable estimate notwithstanding the fact that it will be biased for individual firms (upwards for some firms and downwards for others). Similar issues arise in estimating the asset beta for an individual firm; true asset betas vary across firms even within an industry but the general practice is to use the same estimate for all firms in an industry on the grounds that a reliable estimate for the industry average compensates for the bias. Whether the trade-off favours the use of an average rating rather than ratings for individual firms will not be analysed here. We merely note that the practice of averaging *may* be better than firm-specific estimates, and the practice of averaging is invoked elsewhere in cost of capital estimates. In light of these three points, the imposition of the same rating over all privately-owned transmission businesses would seem to be the appropriate policy.

In summary, and using a regression approach, the estimated credit rating for a wholly privately-owned electricity transmission business is A- at leverage of 60%. This estimate is subject to considerable statistical uncertainty with the 95% confidence interval ranging from the A+/A boundary to the BBB+/BBB boundary. Nevertheless, the confidence interval includes the A rating favoured by the AER and excludes the

⁸ Standard and Poors (2002, page 59) list a number of such factors, including exposure to regulatory and market shocks.

BBB rating favoured by the AEMC. A less sophisticated approach yields a point estimate of at least A- but no confidence interval can be determined. Both approaches provide much stronger support for the AER's use of A than the AEMC's view of BBB.

6. Conclusion

This paper argues that an appropriate credit rating for *all* electricity transmission businesses should be that for a wholly privately owned business, and without any adjustment for conservatism as undertaken by a number of Australian regulators. Examination of the S&P ratings for transmission and distribution business, and using a regression approach, points to an estimated credit rating for a privately-owned electricity transmission business of A- at leverage of 60%. This estimate is subject to considerable statistical uncertainty, with the 95% confidence interval ranging from the A+/A boundary to the BBB+/BBB boundary. Nevertheless, the confidence interval includes the A rating favoured by the AER and excludes the BBB rating favoured by the AEMC. A less sophisticated approach yields a point estimate of at least A- but no confidence interval can be determined. Both approaches provide much stronger support for the AER's use of A than the AEMC's view of BBB. The same rating should be extended to government owned transmission businesses.

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Technical Review

Proposed NER Changes

Chapter 6 Review

Note: This report has been prepared by Farrier Swier Consulting Pty Ltd. Associate Geoff Swier has not been involved in its development.

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Executive Summary

The AEMC has defined a set of rules to enable direct commercial negotiations for the provision of transmission services. The following paper describes a number of concerns and potentially serious negative outcomes from the proposed rule changes.

The AEMC has not described the current market failure that the rule changes are proposed to rectify. In addition, there is no supporting information relating to the anticipated benefits that the proposed rule changes would provide.

In the absence of such analysis, it is not possible to state that the proposed rule changes provide a net benefit that outweighs the identified risks and negative outcomes.

The conclusions of this report are as follows:

- The current processes for reviewing and auditing the allocation of shared services and directly incurred expenditures are insufficient to meet the requirements of the proposed negotiated transmission service framework.
- The proposed negotiated transmission service rules;
 - will create a framework where the misallocation of expenditures (deliberate or not) between prescribed and negotiated transmission services would be very difficult to detect,
 - are not clear on the type of network performance criteria that could be utilised for establishing negotiated transmission services, and
 - will create greater opportunities for the manipulation of the proposed efficiency benefit sharing scheme.
- The selective application of negotiated transmission services could allow TNSPs to selectively isolate assets that provide

increased returns, while receiving regulated returns for assets that remain in the RAB.

- Third-party access to negotiated transmission service assets is not adequately described and potentially allows for the exclusion of access to the negotiated transmission service assets.
- The termination process for negotiated transmission services appears not to have been considered in the draft rules and potentially allows for the selective transfer of non-profitable assets back into the regulated asset base.

Significant additional regulatory oversight and expenditure would be required to enable effective implementation of these rule changes. There are a number of avenues available to identify and review the potential concerns raised above. These include;

- Establishing an approval process whereby the AER reviews applications for negotiated transmission service status,
- Post negotiated transmission service establishment;
 - Benchmarking of negotiated transmission service expenditures and/or services,
 - Audits of cost allocations between negotiated transmission service and prescribed services, and
 - Physical reviews of the TNSP systems, processes and procedures that manage the cost allocations between negotiated transmission service and prescribed services.

2

Negotiated Transmission Services

2.1 Overview

The National Electricity Law places an obligation on the Australian Energy Market Commission (AEMC) to amend the National Electricity Rules relating to the regulation of electricity transmission revenue and prices before 1 July 2006.

As part of these amendments, the AEMC is proposing an additional distinction in the breakdown of Transmission services – a negotiated transmission service. The negotiated transmission service allows the service provider and a third party to negotiate directly for the provision of services above those prescribed.

Negotiations for negotiated transmission services are proposed to be subject to a regulated commercial negotiation regime. Otherwise, the services themselves and the associated revenues will be excluded from the regulatory processes.

The AEMC has described negotiated transmission services to include any of the following¹.

- (a) a shared transmission service that:
 - (i) exceeds the network performance requirements (both as to quality and quantity) (if any) which that shared transmission service is required to meet under any jurisdictional electricity legislation; and
 - (ii) except to the extent that the network performance requirements which that shared transmission service is required to meet are

¹ Draft national electricity amendment (economic regulation of transmission services) rule 2006

prescribed under any jurisdictional electricity legislation, exceeds or does not meet the network performance requirements (both as to quality and quantity) set out in schedule 5.1;

- (b) connection services that:
- (iii) in the case of entry services, are provided to serve a Generator or group of Generators, or a Transmission Network Service Provider or a group of Transmission Network Service Providers, at a single transmission network connection point;
- (iv) in the case of exit services, are provided to serve a Transmission Customer or a group of Transmission Customers, or a Transmission Network Service Provider or a group of Transmission Network Service Providers, at a single transmission network connection point; and
- (v) use of system services provided to a Transmission Network User and referred to in clause 5.4A(f)(3), 5.5(f)(2) or 5.5A(g)(2) (as the case may be) in relation to augmentations or extensions required to be undertaken on a transmission network as described in clause 5.4A, 5.5 or 5.5A,

but does not include a market network service.

The above categories described by the AEMC are similar to the majority of services already provided by the transmission companies as prescribed services, the principal difference being that the existing prescribed services have not been “negotiated”.

The AEMC has indicated in its report on the proposed rule changes that it expects more assets to move into the negotiated transmission service category over time as a result of the rule change.

The AEMC has acknowledged that the creation of an additional category of assets will create another level of complexity in the regulatory processes; *“In these circumstances the question of cost allocation (allocation of asset costs between Prescribed Transmission and negotiated transmission services) will become a significant regulatory issue”*².

The following chapter reviews the technical application of the proposed rule changes.

² Review of the Electricity Transmission Revenue and Pricing Rules. Feb 2006

2.2 Cross-subsidies

The AEMC has identified that the creation of an additional category of Transmission service in the form of negotiated transmission services will create additional complexities for the regulating bodies. One of the principal difficulties will be for the AER to determine whether or not any material cross-subsidies have occurred.

The following section is based on the premise that any cross-subsidy between regulated services and negotiated transmission services represents a sub-optimal or inefficient outcome from the perspective of the regulator and consumer.

Under the present rules a transmission company may provide a range of services that fall into two broad categories: regulated and non-regulated services.

At present, the Australian transmission companies have a small number of assets and/or services that are directly attributable to non-regulated activities. These non-regulated services currently provide revenues that are a very small proportion of overall business revenues.

In the most recent review undertaken by the AER, TransGrid reported earning revenues of \$20 million attributable to "*contestable contracting and utility consulting services*"³. This represents less than 3% of total TransGrid revenues.

Additional non-regulated services that network companies may typically provide are communication services associated with spare bandwidth and/or access to powerline easements and corridors.

2.2.1 Shared Services

Under the current arrangements the AER is required to review the proposed expenditures of the TNSPs to determine the appropriate ring-fencing of regulated and non-regulated services. Cross-subsidies can occur in a number of places under the current scenarios. The following support/corporate services have been previously identified by the AER where companies have claimed expenditures that were inappropriately attributed regulated services:

- motor vehicles and plant;
- administrative equipment; and
- information technology.

³ TransGrid's forward capital expenditure requirements 2004/05 to 2008/9

There are varying methodologies to allocate support services between regulated and non-regulated activities including allocation by total revenues, total operating expenditures, labour hours or labour dollars. The variability of these allocation methodologies can be quite significant with the recent TransGrid review highlighting a 70% variance in difference measures.

This allocative variability was not of significant concern in the TransGrid review as the total expenditure in question was less than 3% of total expenditures. However, with the implementation of negotiated transmission services, the ratio of prescribed services to non-prescribed services could increase to a significant proportion of the total business expenditure.

It is apparent that the current techniques for determining the allocation of shared services would be wholly inadequate if or when negotiated transmission services become a sizeable proportion of a TNSP assets and/or services. The AEMC draft rules do not describe any process or methodology that would provide a solution to this problem.

The current processes for reviewing and auditing the allocation of shared service expenditures are insufficient to meet the requirements of the proposed negotiated transmission service framework. Significant additional regulations and resources would be required to minimise the potential for the abuse and/or inefficient misallocations.

2.2.2 Direct Expenditures

The above discussion has only focussed on the shared services component of TNSP expenditures relating to the negotiated transmission services. The major expenditures of the TNSPs are directly attributable to the regulated assets and include the operations, maintenance and replacement of the regulated asset base.

With the implementation of negotiated transmission services, the AEMC has indicated that "*more assets will be outside the regulatory asset base (RAB) than is currently the case*". As the non-regulated asset base increases, the potential for the misallocation of direct expenditures will increase.

Under the current and proposed rules, the TNSP remains in a position of positive benefit in terms of information asymmetry. In other words, the TNSP has exponentially more information concerning actual expenditures and operating environment than the regulator, and the TNSP is able (within certain guidelines) to control

the amount and type of information that is made available to the regulator.

In addition, the TNSP has a number of financial incentives to cross-subsidise non-prescribed services. Examples of the potential financial incentives include:

- The transfer of expenditures from negotiated transmission services to prescribed services as this may enable the TNSP to manipulate the proposed efficiency benefit sharing scheme (Discussed later in this report), and
- The transfer of expenditures from negotiated transmission services to prescribed services to establish an expenditure pattern for the subsequent regulatory period.

The potential for cross-subsidies currently exists in the established National Electricity Rules, although the potential impact is limited as the volume of non-prescribed services is very small in comparison to overall prescribed services. Cross-subsidies may increase significantly if the volume of negotiated transmission services is increased to even a small percentage of the overall TNSP asset base.

The current processes for reviewing and auditing the allocation of directly incurred expenditures are insufficient to meet the requirements of the proposed negotiated transmission service framework.

2.2.3 Expenditure review options

Under the current regulatory system, the AER has two avenues for identifying areas of potential cross-subsidy or misallocation of expenditures, audits and technical reviews.

Audits can be undertaken annually whereas the technical reviews have historically been utilised to review the forecast expenditures provided by the TNSP under a price review.

Although both the audit and review processes have identified areas of concern with Network Service Provider cost allocations, these reviews have been limited to assessment of the Network Providers stored data and corporate systems. Regulatory reviews and audits in Australia have typically not undertaken field practice assessments to determine that the costs incurred were actually incurred on the assets listed and that those assets were indeed part of the regulatory asset base.

This is a failing of the current regulatory systems, but one that is of limited materiality due to the volume of non-regulated assets and

services. This potential for a material misallocation will increase in line with ratio of non-prescribes/prescribed services.

Scenario 1

If we envisage that a negotiated transmission service has been agreed and a non-regulated asset such as a powerline and/or substation constructed to meet that agreement. The non-regulated assets will then be connected to the main system (regulated assets) at a nominated connection point.

Examples of potential misallocation of incurred costs:

- Inspections and patrols – annual inspections and asset patrols are a significant expenditure for the TNSPs. Most inspections and patrols start at a central hub or major line and radiate from that point.

In this scenario the inspector or patrol-person would most likely not be aware of the delineation between the negotiated transmission service assets and the prescribed assets. If they were aware, the cost capture systems will most likely have difficulty in determining the appropriate allocation of their time and materials.

The deliberate misallocation of negotiated transmission service inspection costs would be very difficult to detect under the current regulatory arrangements.

- Maintenance – maintenance of assets is typically the largest component of a network's operating expenditure. Maintenance can be undertaken on a pro-active (e.g. time-based or risk-based) or reactive basis.

Pro-active maintenance is typically scheduled well in advance and the work crews dispatched to undertake work in a sequential manner that minimises travel times between jobs. The cost allocation difficulties associated with proactive maintenance would be very similar to those described for inspections. The inadvertent misallocation of proactive maintenance costs would be quite possible under this scenario.

Reactive maintenance is typically undertaken on a specific asset based on an immediate need (e.g. to repair a fault or failure). On this basis, the inadvertent misallocation of costs would be less likely than for proactive maintenance or inspection.

The deliberate misallocation of negotiated transmission service maintenance costs (reactive and proactive) would be very difficult to detect under the current regulatory arrangements.

- Replacement – the replacement of aged, unreliable or damaged equipment is the second largest component of network capital expenditure. Australian transmission assets are currently valued in excess of \$9billion and have an average life of approximately 50 years. Even on this simplistic analysis, the replacement of transmission assets will require (on average) hundreds of millions of dollars expenditure every year.

Similar to the above examples, replacement expenditure would be very difficult to audit or review in terms of the correct application between prescribed and negotiated transmission services. The allocation of large assets (e.g. a circuit breaker or transformer) would be more easily reviewed, whereas the allocation of smaller assets would be extremely difficult to ascertain.

Scenario 2

The above scenario (Scenario 1) considered assets where a clear delineation existed between the negotiated transmission service assets and the prescribed assets. A more complex, but ultimately more likely outcome is for a negotiated transmission service that provides for increased service levels through a number of distributed assets.

Examples of this could include:

- a different circuit breaker providing improved bilateral communications and discrimination,
- direct thermal monitoring of lines to increase capacity,
- an additional capacitor to manage inductive loads, etc.

In each of these cases, the assets associated with the negotiated transmission service would be distributed among a larger group of prescribed assets and not easily discriminated from the prescribed assets.

Under this scenario the potential for the inadvertent misallocation of costs between negotiated transmission services and prescribed services would be quite high and the potential for deliberate misallocation even higher.

Both capital and operating expenditure would be very difficult to audit or review in terms of the correct application between prescribed and negotiated transmission services.

The proposed negotiated transmission service rules will create a framework where the misallocation of expenditures (deliberate or not) between prescribed and negotiated transmission services would be very difficult to detect.

2.3 Network Performance

The AEMC has defined a negotiated transmission service to include a shared transmission service that exceeds or does not meet the network performance requirements (both as to quality and quantity)⁴.

The measurement of transmission performance and the setting of targets is extremely difficult. As the transmission network is a provider of electricity transport, it is unable to guarantee the provision of adequate generation and other services that the end user may require.

With the exception of network availability, constraints and network failures, transmission performance targets are very hard to define in a manner that is meaningful and useful to the user.

It is unclear if the linking of a negotiated transmission service to network performance is intended to be prescriptive or to allow increased flexibility in determining negotiated transmission services.

The proposed negotiated transmission service framework is not clear on the type of network performance criteria that could be utilised for establishing negotiated transmission services.

⁴ Except to the extent that the network performance requirements which that shared transmission service is required to meet are prescribed under any jurisdictional electricity legislation.

2.4 Efficiency benefit sharing scheme

Under the draft rules, the AEMC has foreshadowed the implementation of an efficiency benefit sharing scheme. The efficiency benefit sharing scheme is described in the AEMC draft rules as follows:

The AER must, in accordance with the transmission guideline procedures, develop and publish a scheme (an "efficiency benefit sharing scheme") that provides for a fair sharing between Transmission Network Service Providers and Transmission Network Users of:

- (1) the efficiency gains derived from the operating expenditure of Transmission Network Service Providers for a regulatory control period being less than; and
- (2) the efficiency losses derived from the operating expenditure of Transmission Network Service Providers for a regulatory control period...

The benefits of efficiency sharing are well established both in economic theory and regulatory practice. The incentives provided by such schemes can be beneficial to TNSPs and users alike.

However, a potential danger from an efficiency scheme is the ability for manipulation of the scheme through the misallocation of inputs. This potential misallocation exists in all such schemes.

When considered in parallel with the implementation of a negotiated transmission service scheme, the efficiency benefit sharing scheme provides an additional avenue for the deliberate and/or inadvertent misallocation of expenditures.

For example; over-expenditure in a regulatory control period may be misallocated to negotiated transmission services and the TNSP would thereby avoid recurrent years "sharing" of that over-expenditure.

The proposed negotiated transmission service rules will create greater opportunities for the manipulation of the proposed efficiency benefit sharing scheme.

2.4.1 Selective application of negotiated services

Electricity assets are generally long-life assets with a reasonably predictable asset age and maintenance requirements. Over the life of an asset the general trend is for increasing inspection, maintenance and repair (operating expenditure) as the asset gets older.

As the asset or group of assets approach the end of their economic lives, the amount of capital expenditure increases as the assets are replaced (in part or in bulk).

The assets that make up the regulated asset bases of the NEM TNSPs are not of an equal age or age distribution. The transmission assets were built to match the growth of industry, commerce and domestic needs across the states and this has resulted in a range of age profiles that have staggered replacement schedules and differing operating expenditure requirements.

On this basis, each of the TNSPs has a slightly differing ratio of asset value to operating expenditure and capital expenditure requirements. Within any specific TNSP, newer assets will typically require less operating and capital expenditure, whereas older assets will require greater amounts of operating and capital expenditure.

Transmission charges are based on the expenditure requirements of the shared TNSP assets.

With the information asymmetry described previously, the TNSP will be able to “pick and choose” those services that it wishes to contract under the negotiated transmission service system and those that it would prefer to have captured as prescribed services.

For example, new assets typically require less maintenance and operations than older assets. The TNSP would be advantaged in the short-term by establishing new transmission connections as negotiated services. The TNSP would be able to show any prospective partner to a negotiated transmission service that the operating and capital expenditure attributable to the service were below the network average. The third party would be provided with a better outcome (in the short term) and the TNSP would be able to extract the difference between average expenditures and those directly associated with the new assets.

The selective application of negotiated transmission services could allow TNSPs to selectively isolate assets that provide increased returns, while receiving regulated returns for assets that remain in the RAB.

2.4.2 Extensions and connections

All transmission systems are in a state of change. New customers are appearing, existing customers are changing their usage patterns and some customers are departing. The general trend is for growth both in usage and demand.

Extension and connection to the transmission grid is expensive and the connection costs are typically shared between the TNSP and the prospective connectee. As a general rule, the greater the distance from the existing network, the greater the overall costs for extending the network and connection.

The negotiated transmission service proposed in the draft rules allows for direct negotiation between the TNSP and the user for the provision of transmission services. This service could be in the form of additional capacity or new asset such as a transmission line or substation.

As the number of negotiated transmission services increases, the likelihood that a new user will want to connect to the Transmission system at a negotiated transmission service asset will become more likely.

The connection of a new user to a negotiated transmission service asset is not considered in the draft rules and may be problematic. The areas of potential difficulty include:

- Does the existing contract for negotiated transmission services allow for the connection of additional users? If it does not, the new user will need to parallel the existing negotiated transmission service system back to the point of the shared network – an inefficient outcome.
- Are there any mechanisms for reimbursing the original negotiated transmission service customer? From an equity perspective a new connectee should provide some consideration in respect to the capital that was initially invested, and this consideration should be shared proportionally with the TNSP and existing user in relation to their original contributions. Rebate and reimbursement schemes have been notoriously difficult to maintain as the time between the original contract and the new connection increases.
- Is the negotiated transmission service contract allowed to be exclusive? Although most users would welcome a reimbursement on their original network contributions (as long as their service was not affected), some users may wish to exclude their competitors from access to the negotiated transmission service assets. (For example, competing mine-

sites located in close proximity) where the initial user relies on the negotiated transmission service contract to restrict access to subsequent users. This example is akin to the current Western Australian rail access dispute.

It is noted that the existing processes for transmission connection contain the many of the same issues as described.

The proposed negotiated transmission service rules do not adequately describe the process for third-party access to negotiated transmission service assets and potentially allow for the exclusion of access to the negotiated transmission service assets.

2.4.3 Termination

The draft rules do not provide any process for considering the termination of a negotiated transmission service.

Although precedents exist in the transfer of the DirectLink assets to regulated status, the process to identify whether negotiated transmission service assets can be transferred to prescribed assets and the methodology for the transfer is not described.

Based on current contracts, the likely contract durations that the TNSP and user would establish for a negotiated transmission service would be based around the 5 year regulatory review process. This would allow each party to review whether the regulatory processes had changes sufficiently to warrant a change in the contract terms.

An example of the contract duration would be 5 or 10 year initial duration with options for continuance on a 5 yearly basis.

It is unclear from the draft rules as to whether the discontinuance of a negotiated transmission service contract is a trigger for the asset to be rolled across into the Regulated Asset Base.

In short;

- Can the TNSP or the user apply for prescribed asset status?
- What are the triggers for allowing an application to transfer to prescribed asset status?
- What is the process for considering the approval or disapproval of a transfer to prescribed asset status?
- What is the process for resetting the building blocks (e.g. determining capital asset value and operating costs) when an asset is transferred to prescribed asset status?

Following on from the discussions above, if the transfer to prescribed asset status is relatively easy, the TNSPs will have significant incentive to transfer assets between negotiated transmission service and prescribed services based on short term cost differentials.

Refer "Selective application of negotiated services" section above.

The termination process for negotiated transmission services appears not to have been considered in the draft rules and potentially allows for the selective transfer of non-profitable assets back into the regulated asset base.

3

Next Steps

This section of the report investigates the steps that could be undertaken to mitigate the issues identified in section **Error! Reference source not found.** of this report. These recommendations are based on the premise that the proposed chapter 6 amendments are adopted in full or in a manner similar to the current draft.

This report considers that minor changes to the proposed rules would minimise the potential for cross-subsidies and misallocation of expenditures.

The proposed rule changes would cover;

1. The process for establishing a negotiated transmission service, and
2. The process for reviewing negotiated transmission service and prescribed service expenditures.

The proposed negotiated transmission service chapter rules could be modified to provide for an AER review and approval of negotiated transmission services. This up-front review would allow for the early consideration of the negotiated transmission service arrangements and the potential establishment of appropriate processes.

Once a negotiated transmission service is established, the AER has three avenues of review to minimise the potential risks and information deficiencies identified. These areas would best be used in conjunction with each other to reinforce the information available to the regulator. The three areas are; benchmarking, auditing and negotiated transmission service reviews. These areas are discussed in detail below.

Before implementation of the recommendations, it would be necessary to review the potential costs and benefits of the additional undertakings to ensure that the additional costs of the recommendations do not outweigh the potential reduction in cross-subsidies and cost misallocations.

3.1 Pre-Approval

The proposed chapter 6 rules could be modified to allow for the AER to review and approve (or not) any proposed negotiated transmission service.

The minimum requirements of the TNSP application for a negotiated transmission service would require further consideration, but would most likely include;

- Project timing,
- Asset descriptions,
- Proposed capital expenditure,
- Proposed operating expenditure, and
- Proposed service level variations.

This information would allow the AER to consider whether the proposed negotiated transmission service was providing a significantly different service level from the regulatory standards. The AER could also consider the ease (or not) by which the negotiated transmission service expenditures could be reasonably ring-fenced from the prescribed service expenditures and the potential for misallocation.

The AER may also wish to consider the scale of the negotiated transmission service and the contract period.

Approval of a negotiated transmission service could then be based upon an understanding of the proposed negotiated transmission services and the potential for misallocation or cross-subsidies between with prescribed services.

3.2 Ex-post reviews and Audits

The following sections detail a potential process that could be put in place to identify and review cost allocations between negotiated transmission service and prescribed services. The process described is hierarchical in nature with increasing levels of review based on feedback on the scope and scale of the potential concern.

3.2.1 Benchmarking

As discussed in Section **Error! Reference source not found.** of this report, information asymmetry and the potential similarity of services between negotiated transmission service and prescribed services will

create difficulties in independently confirming the appropriate allocation of costs between the two.

To minimise this concern the AER may require information on the negotiated transmission service historical costs to allow a comparison with prescribed service costs.

Examples of the proposed benchmarks could include;

- Asset value vs. operating and maintenance costs,
- Allocation of shared services, and
- Allocation of corporate overheads.

The benchmarks can be utilised in two ways; comparisons with other TNSPs and trending (time-based) of an individual TNSP.

Benchmarks are not easy to undertake in the transmission environment due to the nature of the assets and the timescales involved. It is proposed that the benchmarks would not provide a result in themselves, but rather would provide an indicator of potential areas for further investigation.

3.2.2 Audits

Under the current National Electricity Rules, the AER may “*request or undertake verification and/or independent audit of any information sought by it, or provided to it*”⁵.

To date, the AER has not undertaken an audit of TNSP data, systems or processes.

Regulatory audits are more common in the state based jurisdictions. Annual audits of regulated business reporting are undertaken in Victoria for electricity, gas and water businesses. These audits typically cover performance measures and licence requirements.

The AER may not consider that annual audits are necessary, but the option for a detailed audit could be considered where;

- benchmark information indicated areas of irregularity or concern,
- complaints are received from the general public, consumer representative groups and/or the responsible ombudsman, or
- previous audits had indicated a deficiency or failure of the existing TNSP systems, processes or procedures.

⁵ National Electricity Rules – Chapter 6.2.5(d)

Due to the technical nature of the potential misallocations or cross-subsidies, this report strongly recommends that any audits undertaken by the AER are not restricted to a desk-top review of financial systems, but also include technical processes, physical audits and cost capture systems.

3.2.3 Technical Review

The final option for positively identifying or evaluation a potential misallocation or cross-subsidy between a negotiated transmission service and the prescribed services would be for a detailed technical review of the negotiated transmission service in question.

The current version of the draft rules do not specifically allow for the review of a negotiated transmission service as the service is deemed to be commercial and outside of the prescribed services framework.

Given the issues identified in section **Error! Reference source not found.** of this report, it may be necessary for the AER to review the expenditures, services and asset values that are allocated to a negotiated transmission service by a TNSP to ensure that cross-subsidies and/or misallocations are not occurring.

The intent of the review would be to breakdown the negotiated transmission service costs to a level that would allow confirmation of the expenditures at a detailed level. The review would involve certain audit skills as well as a strong technical understanding of the transmission business.

This report considers that the detailed review of negotiated transmission service assets should be undertaken as a last resort. A technical review would involve considerable time and expense for both the TNSP and the AER.

4

Conclusion

The AEMC has defined a set of rules to enable direct commercial negotiations for the provision of transmission services – defined as negotiated transmission service. This review has identified a number of concerns and potentially serious negative outcomes from the proposed rule changes.

The AEMC has provided a set of draft rules for comment as well as a report describing the background relating to the proposed rule changes.

The information provided by the AEMC does not describe the current market failure that has resulted in the proposed rule changes, or identified any stakeholders who have requested the proposed rule change. In addition, there is no supporting information relating to the anticipated benefits that the proposed rule changes would provide.

In the absence of any identified benefits and acknowledging the potential negative outcomes identified in this report it is difficult to determine whether the proposed rule changes would be of overall net benefit.

A summary of the conclusions drawn in this report is provided below.

- The current processes for reviewing and auditing the allocation of shared service and directly incurred expenditures are insufficient to meet the requirements of the proposed negotiated transmission service framework.
- The proposed negotiated transmission service rules will create a framework where the misallocation of expenditures (deliberate or not) between prescribed and negotiated transmission services would be very difficult to detect.
- The proposed negotiated transmission service framework is not clear on the type of network performance criteria that could be utilised for establishing negotiated transmission services.

- The proposed negotiated transmission service rules will create greater opportunities for the manipulation of the proposed efficiency benefit sharing scheme.
- The selective application of negotiated transmission services could allow TNSPs to selectively isolate assets that provide increased returns, while receiving regulated returns for assets that remain in the RAB.
- The proposed negotiated transmission service rules do not adequately describe the process for third-party access to negotiated transmission service assets and potentially allow for the exclusion of access to the negotiated transmission service assets.
- The termination process for negotiated transmission services appears not to have been considered in the draft rules and potentially allows for the selective transfer of non-profitable assets back into the regulated asset base.

Based on the above conclusions it is reasonable to state that the proposed rule changes relating to negotiated transmission service would not operate effectively within the current regulatory framework. Significant additional regulatory oversight and expenditure would be required to enable the implementation of these rule changes in a satisfactory manner.

There are a number of avenues available to identify and review the potential concerns raised above. These include;

- Establishing an approval process whereby the AER reviews applications for negotiated transmission service status,
- Post negotiated transmission service establishment;
 - Benchmarking of negotiated transmission service expenditures and/or services,
 - Audits of cost allocations between negotiated transmission service and prescribed services, and
 - Physical reviews of the TNSP systems, processes and procedures that manage the cost allocations between negotiated transmission service and prescribed services.

Each of the above processes would require significant additional regulatory oversight and expenditure to enable the effective implementation of the proposed rule changes.