



**Submission to the Essential Services Commission of
South Australia**

**Electricity Distribution Price Review 2005-2010
Response to Draft Determination**

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Executive summary

The Energy Networks Association (ENA) welcomes the opportunity to comment on the *Draft 2005-2010 Electricity Distribution Price Determination* (Draft Determination) released by the Essential Services Commission of South Australia.

The Draft Determination occurs at time of particularly strong community and public policy focus on infrastructure reliability and investment issues. The ENA considers that ESCOSA's final determination should be informed by key findings of the *Report on Electricity Distribution and Service Delivery for the 21st Century* (Somerville Report), the recently completed Productivity Commission review of both the national and gas access regimes, and recent outcomes of similar price review processes in other Australian jurisdictions.

A consistent theme of these reviews has been the need for cautious and balanced regulatory outcomes on access pricing issues which protect the medium-term interests of the community by ensuring the avoidance of costly underinvestment in essential infrastructure.

A key issue of concern for the ENA with the Draft Determination is the significant 'step-change' in the proposed cost of capital applying to the South Australian electricity distribution network. A reduction of the cost of capital by approximately 17.5% in nominal terms has the potential to significantly impact on future investment decisions in relation to energy distribution in South Australia.

The most significant cause of this reduction is the ESCOSA proposal to apply an equity beta estimate of 0.8 - lower than is likely to be applied to any energy distribution network over the next five years. The application of a reduced equity beta estimate of 0.8 would create substantially increased risk of promoting medium-term underinvestment in critical energy distribution infrastructure in an environment where ageing network assets and increasing energy demand are already placing significant pressures on service quality and reliability.

Movement to an equity beta of 0.8 cannot appropriately be justified by the contested methodology which ESCOSA has applied to recent market data. A reduction of the equity beta to 0.8 also ignores the substantial levels of statistical uncertainty which surround market-based estimates of equity betas, and primary reliance on market-based data for beta estimates has a series of unresolved theoretical difficulties which have not been adequately accounted for in the ESCOSA decision.

The aggressively low equity beta value being proposed by ESCOSA also lies outside the range of beta estimates currently being applied or considered by all other Australian energy network regulators. Past regulatory practice suggests a consensus estimate of approximately 1.0 is the most appropriate value to be applied by regulators given the level of uncertainty over the validity of market-based measurements. The ENA urges ESCOSA to apply an equity beta of at least 1.0 (which lies within the bounds of current regulatory practice) to protect the medium-term interests of both ETSA Utilities and the South Australian community in adequately ongoing signals for critical network investment.

Background

This submission responds to the *Draft 2005-2010 Electricity Distribution Price Determination* released by the Essential Services Commission of South Australia in November 2004.

The Energy Networks Association is the national representative body for gas and electricity distribution network businesses. The members of the ENA include:

- ActewAGL
- AGL Energy Networks
- AlintaGas Networks
- Aurora Energy
- Citipower
- Country Energy
- ENERGEX
- EnergyAustralia
- Envestra
- Ergon Energy
- ETSA Utilities
- Integral Energy
- Multinet Gas
- NT Power and Water Corporation
- Powercor
- SPI Networks
- United Energy Distribution
- Western Power

Energy network businesses deliver electricity and gas to over 12 million customer connections across Australia through approximately 800 000 kilometres of electricity lines and 75 000 kilometres of gas distribution pipelines. These distribution networks are valued at more than \$33 billion, and each year energy network businesses undertake investment of more than \$5 billion in network operation, reinforcement, expansions and greenfields extensions.

Context for ESCOSA Draft Determination

The Draft Determination by ESCOSA should fully consider the impacts on energy network regulation of wider economic and public policy contexts.

Three important elements which should inform ESCOSA are:

- the Independent Panel *Report on Electricity Distribution and Service Delivery for the 21st Century* (Somerville Report)
- recent public inquiries by the Productivity Commission into operation of the national and gas access regimes
- an increasing focus in recent price reviews in other jurisdictions (e.g. NSW and Queensland) on ensuring future network tariffs take into account refurbishment and expansion needs arising from ageing network infrastructure and expanding electricity demand

A consistent theme of these reviews has been the need for cautious and balanced regulatory outcomes on access pricing issues which protect the medium-term interests of the community by ensuring the avoidance of costly underinvestment in essential infrastructure.

Approach to cost of capital and equity beta issues

The ESCOSA Draft Determination results in one of the lowest pre-tax weighted average cost of capital - 6.81 per cent - for any energy distribution system in Australia (when measured as a margin over the prevailing risk free rate).

Impact of equity beta assumption on cost of capital estimate

The reduction from the current 8.26 per cent pre-tax cost of capital is one of the most severe 'one-off' reductions of applicable cost of capital in the energy infrastructure sector. A primary contributing factor to this low cost of capital estimate is ESCOSA's draft conclusion that an appropriate equity beta estimate is 0.8. The ENA considers this estimate fails to accurately reflect the actual level of risk faced by ETSA Utilities. A more balanced appraisal of the methodological uncertainties involved in beta estimation should inform ESCOSA's final decision.

To illustrate this, if an approach was adopted that accurately reflected the inherent limitations and uncertainties in deriving estimated equity betas from market evidence and placed reliance on previous regulatory precedent, a beta of at least 1.0 would be the likely estimate. Applied in conjunction with all of the other cost of capital inputs used by ESCOSA, this would have resulted in a WACC of approximately 7.4 per cent (which is approximately the mid-point between the current cost of capital estimate and that contained in the Draft Determination).

Deriving equity betas from market evidence

The estimation of the equity beta of individual firms from market evidence is a complex and contentious area of discussion in financial economics.

It is well recognised that the estimation of equity betas for listed and non-listed firms is a complex analytical exercise with statistically imprecise outputs. Beta estimations also involve significant amounts of discretion which further impact on the replicability of the output.

The statistical accuracy of equity beta estimation is also likely to be adversely impacted by:

- ***a lack of close comparators for non-listed entities*** – while there are some listed entities from which proxy equity betas can be derived, arguably none of these share the particular risk characteristics of ETSA Utilities
- ***use of stock returns as a proxy for market returns*** – finance theory would suggest that distortions are likely to be introduced into beta estimates by this

process as stock returns represent only a subset of actual markets available to investors (for example, residential and commercial property, collectibles and precious metals)

- ***variability of measured equity betas through time*** – which may impact on historical measurements, and which has also given rise to the well known ‘Blume adjustment’ which reflects the observed convergence of most firms equity beta towards 1.0 over time
- ***influence of significant market movements and corrections*** - with significant evidence that one-off market ‘bubbles’ (such as the ‘technology boom’) and subsequent corrections can severely distort equity beta measurements
- ***uncertainty over basing forward looking estimates on past measurement*** – the capital asset pricing model is a forward looking model, and there is uncertainty over the explanatory power of historical beta in terms of forward beta estimates
- ***variability of measured beta estimates based on the time period chosen*** – with equity betas varying substantially according to the sampling period selected
- ***variability of measured beta estimates based daily, weekly or monthly data***– the use of these different inputs at times produces large variations in beta estimates
- ***influence of non-regulated activities with different risk profile*** – accurate equity beta estimates should take into account the different risk characteristics of other related competitive activities of regulated entities, however, no sound methodology for achieving this has yet been developed
- ***changes to levels of systemic risk from changes in the form of regulation*** – with the movement to price cap regulation imposing significant new systematic risk compared to the previous revenue cap regulation

These methodological issues place a considerable constraint on the extent to which measured equity betas can be used as a primary input into network pricing determinations which have significant consequences for investment in long-lived network assets.

Treatment by ESCOSA of market evidence

While some of the factors outlined above appear to have been taken into consideration by ESCOSA, other significant methodological issues appear to have been overlooked in the Draft Determination.

For example, no significant consideration has been given to the lack of evidence that AGL, Envestra, United Energy, APT and AlintaGas are appropriate proxies for ETSA Utilities in relation to their risk characteristics compared to the market.

As noted above, beta estimates used in association with the capital asset pricing model should be a *forward looking* estimate of equity betas. This implies that when using historical observations it is reasonable to assume that equity betas will revert to their longer term historical average. This assumption is violated by ESCOSA’s decision to base its equity beta primarily upon an imperfect ‘post bubble’ weekly series of data

that may barely capture the commencement of a reversion to a more stable historical average.

The imperfections of the weekly data series – the output of which ESCOSA appears to have applied – are acknowledged by ESCOSA itself:

The more recent evidence (60 week beta estimates) suggests that if the Commission were to place exclusive reliance on current market evidence, a beta of 0.82 would be considered appropriate for a regulated Australian electricity distributor. Note, however, that the beta estimate still has a wide confidence interval – its 95 per cent confidence interval is approximately 0.82 ± 0.47 .¹

ESCOSA establishes that it can be 95 per cent confident that an appropriate equity beta falls in the range from 0.35 to 1.29 – that is, that there can only be a *low* level of confidence that 0.82 provides an accurate estimate of a beta. Despite this, ESCOSA claims that it is adopting a conservative approach in its pricing determination which reflects the need for adequate medium-term investment in the South Australian electricity distribution network.

Table 10.1 in the ESCOSA determination also demonstrates that the issue of measured betas shifting over time is a particularly serious one for forward estimations of beta.² For example, it is not credible – as suggested by Table 10.1- that the risk characteristics of electricity and gas distribution infrastructure have moved from a beta of over 1.0 in 1999 to 0.20 in a four year period in which the regulatory framework for most energy networks was relatively stable. This significant instability in measured equity betas needs to be better recognised and integrated into ESCOSA's decision-making process.

Lack of consistency with previous Australian regulatory practice

The ESCOSA's decision to adopt an equity beta assumption of 0.8 is inconsistent with the overwhelming majority of past regulatory determinations.

Table 1 (overleaf) details the equity beta assumptions adopted in recent Australian regulatory decisions in relation to energy infrastructure regulation.

¹ ESCOSA *Draft 2005-2010 Electricity Distribution Price Determination – Part A Statement of Reasons, December 2004*, p.172

² ESCOSA (December 2004), p.170

Table 1- Equity beta assumptions – Australian regulatory decisions

Regulatory authority	Sector	Network operator or asset description	Proxy equity beta assumption (mid point where range given)
ACCC	Electricity transmission (2002)	Electranet	1.0
	Electricity transmission (2002)	SPI Powernet	1.0
	Electricity transmission (2001)	Powerlink	1.0
	Gas transmission (2003)	Moomba-Adelaide Pipeline	1.16
	Gas transmission (2002)	Principal Victorian gas network	0.98
	Gas transmission (1998)	Principal Victorian gas network	1.20
ERA (formerly OffGAR)	Electricity distribution (2005)	Principal Western Power network	1.0*
	Gas distribution (2000)	AlintaGas WA gas networks	1.08
ESC	Gas distribution (2002)	Victorian gas networks	1.0
	Gas distribution (1998)	Victorian gas networks	1.2
	Electricity distribution (2000)	Victorian electricity networks	1.0
ESCOSA	<i>Electricity distribution (2004)</i>	<i>ETSA Utilities</i>	<i>0.8 (draft)</i>
ICRC	Electricity distribution (2004)	ACT electricity network	0.9
	Gas distribution (2004)	ACT and surrounds network	0.9-1.09 11 (midpoint 1.0)
IPART	Electricity distribution (2004)	NSW urban and regional networks	0.78-1.11 (0.95)
	Electricity distribution (1999)	NSW urban and regional networks	0.78-1.14 (0.96)
	Gas distribution (2004)	AGL Gas Networks	0.78-1.11 (0.95) (Draft)
	Gas distribution (1999)	AGL Gas Networks	0.9-1.1 (1.0)
	Gas distribution (1999)	NSW regional network	0.96-1.10 (1.03)
QCA	Electricity distribution (2004)	Qld urban and regional networks	0.9 (Draft)
	Electricity distribution (2001)	Qld urban and regional networks	0.71
	Gas distribution (2001)	Queensland gas networks	0.97

* - proposed by Allens Consulting Group

From the evidence contained in Table 1 it is possible to make several observations on past regulatory practice equity beta assumptions and ESCOSA's proposed approach. For example:

- ***regulatory practice over the past seven years has converged on an equity beta value of 1.0*** – with the simple average of pending and past regulatory decisions detailed in Table 1 being approximately 1.0
- ***the ESCOSA estimate of 0.8 is more aggressive than all but one previous regulatory ruling*** – with the only lower past estimate being recently identified by the QCA in its most recent Draft Determination as a regulatory error in the light of subsequent data³
- ***ESCOSA is proposing the adoption of the lowest point estimate on which a final cost of capital determination ever been based in Australia*** – primarily, it would appear, on the basis of applying highly contested methodologies to recent market data

³ Queensland Competition Authority *Draft Determination – Regulation of Electricity Distribution*, December 2004, p.103

ESCOSA states that most Australian regulators have adopted a proxy equity beta of between 0.7 and 1.2, with many adopting a value close to 1.0.⁴ In fact, aside from the QCA, to date all Australian regulatory authorities to date have set regulated charges by using equity betas estimates in a range from 0.9-1.2.⁵

The ENA considers that in the light of the significant and identified difficulties with placing reliance on current market derived equity beta estimates (including high standard errors and the systemic bias which the recent ‘technology boom’ and subsequent market adjustment has created for beta estimates) significant weight should be placed on consistency with past decisions of other Australian regulators.

Response of other regulatory bodies to beta measurement issues

Other Australian regulatory bodies have responded to the numerous methodological difficulties outlined above by placing a lesser emphasis on measured betas, and proportionally greater weight on past regulatory practice, the risk of regulatory error, and the desirability for of avoiding step-changes in cost of capital estimates.

The ESC in its 2002 *Review of Victorian Gas Access Arrangements* opted to approve cost of capital estimates that were based on proxy equity betas of 1.0. In doing so the ESC extensively surveyed recent market evidence, but considered that it was not able to place significant weight on this evidence, given the substantial uncertainty associated with statistical derivations of beta from limited data available. Instead, the ESC noted that it preferred to adopt a ‘conservative’ approach of placing considerable weight on the potential long term consequences of the decision and the practice of other Australian regulators.⁶ The ENA notes that since this decision, there has been a net reduction in the number of listed comparators (and consequentially, useful market data) in the Australian market – with the delisting of United Energy.

The ACCC has similarly noted the statistical imprecision of equity beta estimates based on market evidence. In recent energy transmission decisions it has consistently adopted estimates in a range between 0.98 and 1.2, with each of its recent electricity transmission revenue cap decisions being based on estimates of 1.0. Most recently, the ACCC has reaffirmed its approach of placing greater weight on past regulatory precedent and avoiding under-compensation of service providers through the use of beta calculated during periods of possible short-term deviation from historical norms. In its December 2004 *Statement of Regulatory Principles for the Regulation of Transmission Revenue* it has signaled its intent to continue to apply an equity beta estimate of 1.0.⁷

A material discrepancy between the applied equity betas for transmission and distribution networks implies that ESCOSA’s decision may open up a systemic investment distortion between SA electricity distribution assets and electricity transmission assets across Australia (including those located in SA) The Draft

⁴ ESCOSA (December 2004), p.177

⁵ This assumes that where a range was used that the mid-point estimate of the beta range was used. This is a conservative assumption given that several IPART decisions have effectively adopted cost of capital estimates above the mathematical mid-point of the calculate possible range (which in turn would imply the effective equity beta input into these cost of calculations were from the upper range of that indicated in Table 1).

⁶ Victorian Essential Services Commission *Review of Gas Access Arrangements – Final Decision*, October 2002, p.361

⁷ ACCC *Statement of Regulatory Principles for the Regulation of Electricity Transmission Revenue*, December 2004, p.108

Determination may also introduce similar potential investment distortions between electricity and gas distribution infrastructure, given that no Australian regulatory authority has based a cost of capital estimate for a gas distribution network on an effective equity beta of less than 0.9.

In January 2005 the WA Economic Regulation Authority released a report *Electricity Networks Access Code 2004: Advance Determination of a WACC Methodology*, prepared by Allens Consulting Group. Several elements of the report are directly relevant to ESCOSA's task of selecting an appropriate equity beta estimate.

- first, Allens Consulting warns that the use of a shorter time period and more frequent sampling to attempt to remove the impact of unusual events 'may create econometric problems' and a downward bias in the beta estimate⁸
- second, it is noted that the most commonly utilised commercial approach is to use 4-5 years of monthly returns⁹
- third, that Allens Consulting saw no reason to alter its previous recommendation to the ACCC of an appropriate equity beta being around 1.0¹⁰

Given the re-endorsement in the report to the ERA by Allens Consulting group of its previous recommendation of an appropriate equity beta of 1.0, the ENA queries on what basis ESCOSA considers it is justified in adopting an equity beta for the SA electricity distribution network which differs materially from those applied in other States and Territories.

Deriving equity beta estimates for regulatory decisions

The adoption by ESCOSA of a 0.8 equity beta effectively means that:

- ESCOSA appears to be placing undue weight on recent market evidence which both it and other parties understand may be biased by significant corrections in equity markets over the 2001-02 period; and
- at the same time - whilst claiming to have reference to past decisions of Australian regulatory bodies – is proposing to adopt what will be the lowest equity beta benchmark from 2005-2010, and an estimate which is the second lowest ever used by an Australia regulator in a past regulatory decision

An approach which placed the appropriate weight on recent market evidence, and was within the range currently adopted by regulatory bodies, would lead ESCOSA to an equity beta estimate of 0.9-1.1 (with the consensus approach of most Australian regulators being to retain an equity beta of at least 1.0).

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⁸ Allens Consulting Group *Electricity Networks Access Code 2004: Advance Determination of a WACC Methodology, Report to the WA Economic Regulation Authority*, January 2005, p.34

⁹ Allens Consulting Group (2005), p.35

¹⁰ Allens Consulting Group *Empirical Evidence on the Proxy Beta Values for Regulated Gas Transmission Activities - Final Report*, July 2002, p.6