



People Powering People



DRAFT DECISION

**FORM OF REGULATION OF ELECTRICITY DISTRIBUTION
TO COMMENCE FROM 1 JULY 2005**

Ergon Energy Response

May 2003

This submission, which is available for publication, is made by:

Ergon Energy Corporation Limited ("Ergon Energy")
P O Box 107
Albert Street
BRISBANE QLD 4002

Enquiries or further communication should be directed to either:

Tony Pfeiffer
Manager Regulation, Networks
Email: tony.pfeiffer@ergon.com.au
Ph: (07) 3228 7711
Fax: (07) 3228 8255

Paul Asnicar
Regulatory Review Manager
paul.asnicar@ergon.com.au
Ph: (07) 3228 2138
Fax: (07) 3228 8255



1. SUMMARY

Ergon Energy welcomes the opportunity to respond to the Authority's Draft Determination on the Form of Regulation.

We see the key issues as follows:

- The risk of forecast error is real and we believe that the Authority has not addressed this issue.
- The Hybrid Revenue Cap as proposed by Ergon Energy was an attempt to address the risk of forecast error.
- If the hybrid revenue cap is rejected, some workable method of addressing the possibility of forecast error is required within the fixed revenue cap. A possible mechanism is addressed below.
- If this issue can be addressed, Ergon Energy considers that a Fixed Revenue Cap will work effectively, and is appropriate, for the next regulatory period.

What follows is a more detailed response to sections of the draft determination.



2. RESPONSE TO SECTIONS OF DRAFT DETERMINATION

In this section comments made by the Authority in its draft determination are shown in the highlighted boxes with Ergon Energy's response in the following text.

2.1. Different Forms of Regulation for each distributor

However, it [the Authority] believes that any drawbacks would be marginal and would be outweighed by the benefits for both distributors and their customers associated with using the approach that best suits each distributor's particular circumstances.

Ergon Energy commends the Authority on the recognition of the differences between the two Queensland distributors, and would encourage the Authority to carry through this line of thought during the forthcoming regulatory period.

2.2. Volume Risk or Forecast risk

Ergon Energy's preference for a hybrid revenue cap appears to be due mainly to its concerns regarding volume risk.

Ergon Energy considers that the term 'volume risk', unfortunately one termed by Ergon Energy in its submission to the QCA, can be seen as a desire to avoid risk (as it has been seen by the QCA) instead of the manner in which it is intended – to account for the almost impossible situation of predicted demand and its possible consequences. As is pointed out below, while a great amount of effort is contributed to the estimates, there are no guarantees that the conditions driving the estimates will be fulfilled. While Ergon Energy can predict the hazards in this estimating process, there is no scientific or business method that can provide Ergon Energy with the future position. Set out below are two of the hazards that are of most concern to a dispersed rural distribution network such as Ergon Energy's.

Air Conditioning Load

For example, EnergyAustralia and Integral Energy both experienced high unforeseen growth in peak demand during their previous regulatory period, largely due to airconditioner load. Under a fixed revenue cap, the increase in costs, above those allowed in the building block approach, brought about by this increase in demand were unable to be recovered.

This issue needs to be considered in the next regulatory period since the current penetration of air conditioners in Queensland is low, but is increasing, and has the potential to impact the system considerably in the next regulatory period. The issue of air conditioning and its impact on the network is expanded in section 3.

Ergon Energy could be in a similar position to the NSW distributors in the next regulatory period if the potential for forecast error is not adequately addressed in the form of regulation.

Furthermore, with increasing consumption under a fixed revenue cap, customers could potentially see a reducing price, which encourages further consumption by customers without regard to the time of day they consume – this leads to over



consumption at times of network congestion when the marginal costs are higher than the averaged cost price signal they are seeing.

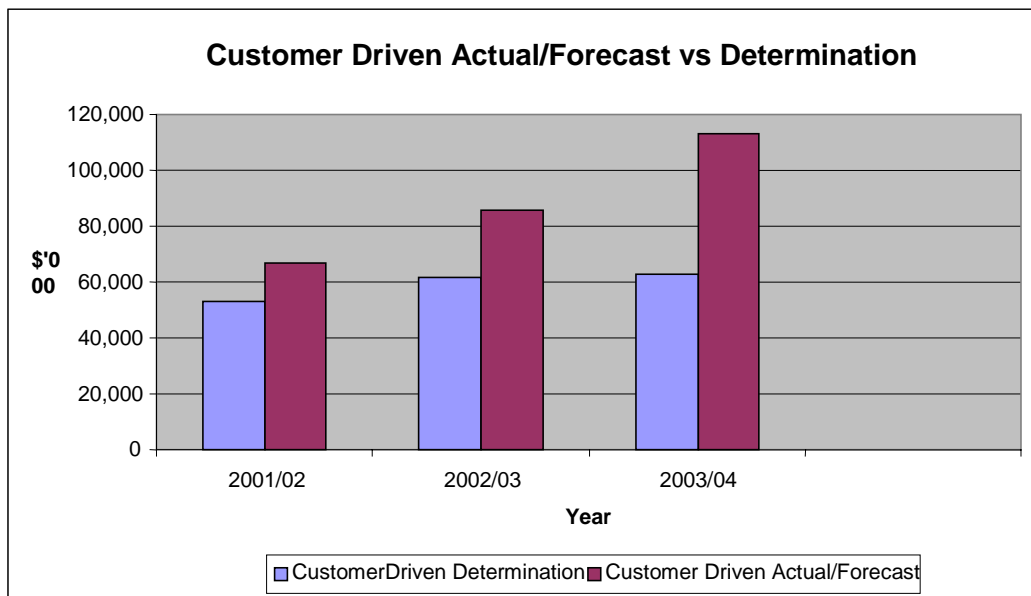
Unpredictable New Connections

Further Ergon Energy is also susceptible to large-scale customer additions to its network – typically large industrial consumers. These are also impossible to predict with any accuracy, as there is little diversity in such connections (example below). This risk is ever present for Ergon Energy due to the nature of its service territory and represents a serious capital overrun risk to Ergon Energy.

The Authority has not addressed these issues in its draft decision.

The following graph shows that forecasting customer driven new network investment (for connections) and relieving network constraints (due to increased customer loads), represents significant risks, and these issues have had a dominant effect on Ergon Energy within this current regulatory period.

The graph shows the actual/forecast Customer Driven Capex vs the Determination forecast.



It was clearly impossible to forecast at the time the addition of some very large customers to Ergon Energy's system. A mere three customers account for approximately \$70 million in customer driven Capex during this regulatory period out of a total overrun of \$93 million (75%).



2.3. Forecast Risk is real and substantial

While acknowledging Ergon Energy's concerns about volume risk, the Authority believes they are perhaps overstated and, if necessary, could be alleviated by actions separate to the choice of the form of regulation.

It is noted that the Authority's statements in this section pertain to "volume risk" and not to "forecast risk". We would contend that forecast risk is not overstated, and is highly material as shown by the NSW distributors, and our current situation. The risk is real.

Preliminary modelling for Ergon Energy shows that an underestimate in per-customer demand growth of 2% per year results in revenue under recovery of \$155 million over the five years. The shortfall is driven by the increased capital expenditure required to service the demand growth.

We do not disagree with the Authority's statement that these issues can be alleviated by actions separate from the form of regulation. However as these have not yet been determined, or agreed between Ergon Energy and the Authority, we are seeking acknowledgment from the Authority of the potential risk, and also assurances that it will be adequately dealt with in the final determination.

2.4. Mitigating risks by other mechanisms

For example, the form of regulation should not be chosen to mitigate risks faced by distributors, such as asset stranding, that could be more directly (and perhaps more appropriately) addressed through contractual arrangements between distributors and customers.

This is true for large customers. A large customer could vacate an asset and leave it stranded. It is also possible to contract directly with large customers. But is impractical to apply these principles to many small customers for two reasons:

- Small customers rarely strand an asset. Small customers vacating the network will only strand their connection assets, the bulk of the network will simply be potentially left under-utilised.
- Secondly, it is not practical to contract directly with every small customer nor does the distribution network have a direct relationship with such customers.

Ergon Energy agrees however, that risks should be addressed by other means if more appropriate than the Form of Regulation.



2.5. Mitigating Volume Risk

Also, the volume risk that arises because revenue drivers differ from cost drivers is a direct result of distributors' continued over-reliance on volume-based charges, which do not reflect the essentially fixed-cost nature of distribution networks or the true drivers of variable costs, not the form of regulation.

As the Authority is aware, Ergon Energy has brought more cost reflective pricing to all customer groups, including a significant reduction in the reliance on volume based charges. This mitigates somewhat the risks associated with revenue recovery. However, risks still exist if the Form of Regulation itself indexes revenue in an inappropriate way, and does not recognise the true cost drivers of the network.

A simplistic example is where peak demand growth is high, and volume growth is low (ie progressively poorer load factor – this is common for example with air conditioning load.). Revenue recovery, if based on cost reflective pricing, would be aligned with the high growth peak demand driver. This will be higher than the determined revenue, which is aligned with the proportionately low growth in volume. The revenue over-recovered in this scenario would be returned through the overs and unders account, even though it would be legitimate recovery of sunk costs.

2.6. The benefits of Hybrid, and the alternative

As a result, the Authority is not convinced that the risks faced by Ergon Energy are sufficient to warrant the use of a hybrid revenue cap which could result in an inequitable sharing of volume risk. Specifically, by allowing revenues to closely track costs, the hybrid cap would limit Ergon Energy's exposure to volume risk, while at the same time increasing the volume risk borne by Ergon Energy's customers.

The proposition of the hybrid revenue cap was an attempt by Ergon Energy to provide a practical way to address the criteria listed by the QCA.

Ergon Energy believes all the issues raised in its response to the discussion paper were legitimate, addressed the criteria, and therefore were not intended to convince the Authority of anything but the reality of the issues faced by Ergon Energy in its business.

It is therefore disappointing that the hybrid proposal has been dismissed without addressing the business issues raised by Ergon Energy in some detail. The Authority needs to apply itself to the issues and criteria it raised in the discussion paper, in particular, how its proposal will address forecast risk. There is no response to this issue in the Authority's comments on the Ergon Energy submission and yet it is the key issue.

It is possible to address forecast risk under a fixed revenue cap, but the QCA has chosen to be silent on this issue. It may be implicit that the Authority intends to implement a within-period adjustment trigger as per the 2000-05 regulatory period determination:



At that time the Authority will also consider applications from a DNSP for either a within-period adjustment to the revenue cap or a dispensation from the need to immediately correct any associated under- or over-recovery of revenue when both:

- **the DNSP's actual revenue or its updated annual revenue requirement can be shown to diverge from the revenue cap set by the Authority by more than the maximum tolerance limit (5 per cent) set out in Table 3.1; and**
- **the DNSP can demonstrate that the underlying cause of such divergences is directly the result of factors outside its control.**

If this provision is in place, Ergon Energy's concerns about the Fixed Revenue Cap are reduced. However the mechanism should be reviewed because:

- The current specification is vague and ambiguous. For example, it is difficult to apply under the current smoothing arrangements.
- Scale of the deadband needs to be reconsidered as 5% of revenue represents a material risk exposure by Ergon and its customers. Ergon Energy would propose that 3% would be more appropriate.

If the Fixed Revenue Cap is adopted, Ergon Energy believes the best approach would be for a mid-period review option (assuming that the next period will be for five years), to be triggered by either Ergon or the QCA based on agreed deadbands for the following specific measures/indices:

- Capex associated with customer requested works
- Non-diversified MW aggregated for all Zone substations (or some other agreed peak demand measure.).

The concept would be for the initial forecasts to be set on the basis of set measures or indices, the key ones that have volatility (and hence significant forecast risk) would be those outlined above.

If these measures or indices have moved such that there is a revenue outcome of 3% up or down, then the mid-term review can be triggered. If this condition were not met then no review would be required. This would allow for re-examination of the revenue effects under the fixed cap of capex projections materially altering and options for dealing with these effects. This need not be an extensive exercise, as it will focus on the movements in agreed measures/indices – these being agreed at the initial determination.

The issue of "allowing revenues to closely track costs" is addressed in the next paragraphs.



2.7. Rate of Return

In addition, an important implication of the use of a hybrid revenue cap would be that the incentive for Ergon Energy to minimise costs, including adopting cost-minimising innovations, would be reduced because revenue would be allowed to track movements in costs more closely than under a fixed revenue or price cap. This would be a significant concern while cost efficiency remains a key goal of regulation.

The Authority believes that the hybrid revenue cap as proposed by Ergon Energy equates to "rate of return regulation" and provides no incentives to reduce costs.

Ergon Energy again challenges this conclusion and asserts that the incentive to reduce costs under the hybrid are just as strong as under the fixed revenue cap, but that the hybrid reduces risks to both customers and the distributor. We reiterate what was submitted in the response to the discussion paper:

“Ergon Energy rejects the statement that the hybrid revenue cap removes the incentive to increase profits by decreasing cost. For a hybrid revenue cap, a portion of the revenue is indexed to represent the expansion of the network. These indices do not represent actual costs so there is still incentive for the DNSP to provide this expansion in the cheapest way possible. Say, for instance, that the variable part of the revenue is indexed according to the number of customers added, the amount of kVA capacity added to the network, the km of line added and the decrease in SAIDI, the DNSP has incentive to provide for this expansion in the cheapest way possible to increase profit. This hybrid scheme recognises that the DNSP is not able to restrict this expansion. Therefore, it encourages true efficiency in the delivery of the expanded service.”

It may be that the Authority did not fully evaluate our submission on this issue and we would be happy to make a presentation on it in more detail if that would assist in this determination.

3. RISKS OF INCREASING DEMAND - AIR CONDITIONING PENETRATION

Currently in Australia the market for air conditioners is expanding rapidly. These units have three effects on the electricity delivery chain:

- They increase the sales of energy (kWh);
- They disproportionately increase these sales when temperatures are very high – they congest the delivery systems with high utilisation for very short periods – termed “peakiness” - in effect they have a lower load factor¹ than most other appliances;
- They have poor power factors², which means they are not as efficient at using the electricity delivery assets as other major appliances such as water and room heating units – for each MWh they consume they actually need more capacity to supply this than these other major appliances.

¹ Load Factor is average load over peak load.

² Power Factor is the ratio of actual power to apparent power



This has several affects on distribution networks:

- The demand that the units will place on the system becomes heavily weather dependent and in fact this drives the peak system demand, and certainly localised demand, where take up of such units is high. The effect of this is dramatic when penetration starts to climb as in the very hot weather the units loose diversity – this means that all the units start to run continuously (usually they are controlled so they come off and on by the thermostat) and at the same time creating massive summer peaks for short durations – placing the full (undiversified) demand of the air conditioners on the system. This means that to forecast the demand for regulatory purposes means being able to forecast the weather accurately, and to do so five years out – a feat not accomplished by any group so far.
- The power factor means that more system capacity must be made available than would be the case for other major appliances and this inefficiency also creates additional costs for the network, and added forecasting problems.
- The air conditioning systems actually peak on the extremely hot days and this is when the network systems are at their lowest rating in terms of thermal temperatures having an effect on system performance. Network capacity is weather dependent as high loadings make the wires hot and the ability to shed this heat decides the real usable capacity – so they are at their most derated when it is extremely hot and the derating effect is significant and material – there has to be more investment in asset than would be the case if the demand was caused by other major appliances.
- The use of averaged tariffs based on energy consumption does not correctly signal the costs associated with servicing the demand during the peak periods. This creates over consumption on the peak, which in turn creates major cross subsidies³ and deadweight loss. To compensate for this requires complex new tariff arrangements (both network and retail tariffs) based on extensive customer research, and possibly new metrology such as interval meters. This all takes time to implement and properly justify in a regulatory setting.

The forecasting of capital requirements to service the peakiness becomes tied to being able to forecast the weather effects, or at worst case to over compensating with high demand forecasts. This is especially exacerbated in revenue cap regulatory regimes, which depend heavily on accurate capital and load forecasts.

This is not a volume risk issue but one associated with capital driven by peak demand – it is not feasible to approximate peak demand risk using volume growth. If a revenue cap approach is taken (not a Hybrid approach which can alleviate a lot of this problem) then these issues need to be taken into account in the design of that regime, and this is possible to achieve, but may involve mid term reviews, use of indices and use of agreed design parameters such as designing for 1 in 20 year temperature events, etc.

³ The common problem is that only a percentage of customers have air conditioners that actually contribute to the peak demand on the network and yet with averaged tariffs the costs go up due to this increased peakiness and they are spread across all consumers. Hence some consumers are subsidising others. It also is the case that many of these consumers are small energy users and they are providing subsidies to larger energy consumers – quite the reverse of typical equity arguments.



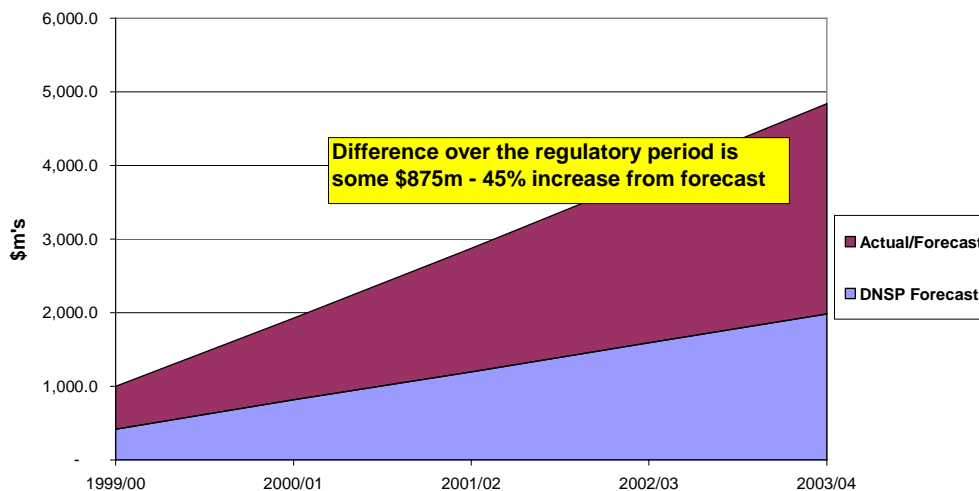
3.1. Evidence from NSW⁴

To demonstrate the issue one needs look no further than NSW. IPART is undertaking a review of the regulatory regime for NSW DNSPs and publicly available information is emerging about the dramatic impacts air conditioning growth is having on the key networks in NSW.

This has been occurring for the last two or three years and the impact on capital expenditure has been insightful – it is a precursor to what Queensland can expect and clearly demonstrates the growing inability for networks to accurately forecast peak demand and hence capital requirements as the network demand becomes more aligned with weather conditions.

The following graph shows the cumulative effect over the last regulatory period (4 years) in NSW on capital expenditure by the DNSP's (Inland Energy not included). Whilst all of this effect may not be due to air conditioning it is emerging quite clearly that the majority of it is actually tied to the weather conditions being experienced and the relative impact of air conditioning penetration in NSW markets.

Capital Expenditure - Cummulative Forecasts and Actuals for NSW Major DNSPs



The forward capital projections in NSW are even more alarming and they are based on continued penetration of air conditioning in the residential and small commercial markets. EnergyAustralia for example (alone) is forecasting expenditures of \$1.8 billion over the next regulatory cycle – some 42% of their capital base. The relative impacts on pricing, cross subsidies and potential lower returns for networks is staggering. And this will flow up the chain to transmission and generation with low utilisation assets being added to the delivery chain and paid for by consumers or shareholders, or both.

⁴ This material is drawn from the IPART document Regulatory Arrangements for the NSW Distribution Service Providers from 1 July 2004, Issues Paper DP58 November 2002; and submissions on this issue paper by the major DNSP's in NSW.



3.2. Growth of Air Conditioning in Queensland

The growth being seen in air conditioning penetration is starting to also be seen in Queensland and it is clear that the drivers of this growth are the same if not greater for Queensland.

More importantly the trend is now more for fully ducted systems rather than window, wall and split systems. The ducted systems have a major impact on networks, as the marginal demand is some 3 to 4 kVA per unit for less than 25 hours of the year, based on reports from NSW. This effectively doubles the design standards for substations and hence the capital increases relatively in line with this doubling. This is what is driving the capital investments in NSW – to simply service this peak demand. This is also why Ergon Energy wanted to have some provision in the regulatory regime to account for this major risk.

Household Penetration of Air Conditioners (BIS Shrapnel)

	NSW 1997/98	1999/00	2001/02	Qld 1997/98	1999/00	2001/02
Window and Wall Systems	19%	18%	19%	23%	22%	23%
Split Systems	6%	7%	11%	4%	6%	8%
Ducted	7%	8%	11%	1%	2%	2%
Total	32%	33%	41%	28%	30%	33%

This analysis shows that Queensland was still under NSW penetration rates as of end 2002, but that NSW saw a major jump in the uptake of systems in just one year (8% market penetration increase in one year – some 25% growth in penetration or an effective 8 times increase in sales of systems) and these were mainly split and ducted systems. Based on this research it can also be seen that Queensland is below NSW penetration rates in split systems and this has been catching up rapidly, and has a lot of market opportunity for the take up of ducted systems.

The key issue here is that the trend in NSW is being driven by the same retailers of air conditioners that are in Queensland, and the ability for customers to integrate high cost systems into their mortgages either when establishing them, rolling them over or simply using equity type products has also been a major driver for the uptake of ducted systems.

There is demand in the market for these systems, experienced sellers with good ranges of competitively priced products and easy financing options. Discussions with some retailers have indicated that they see the same boom happening in Queensland that is occurring in NSW, especially with the lower penetration rates currently in Queensland and arguably a more humid and higher average temperature environment. The migration north to Queensland of customers from the southern states also influences the take up rates.



4. CONCLUSION

Clearly the selection of the regulatory regime has an effect on the potential outcomes for the Ergon Energy network, its shareholders and the electricity industry as a whole in Queensland, and for customer prices and subsidies. It is a key State issue. Whilst Ergon Energy needs to undertake a lot more detailed market analysis and modelling to try and forecast the potential impacts of air conditioning and mitigation options it is also clear from the NSW experience that trying to forecast capital expenditure related to demand growth is introducing far more risk and needs to be taken into account by the QCA in this regulatory review. It is of great concern that the Authority has not addressed these issues and Ergon Energy is available to assist in these deliberations.