



Issues Paper

Efficiency Carryover Mechanism

September 2004

Queensland Competition Authority

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Level 19, 12 Creek Street Brisbane Qld 4000
GPO Box 2257 Brisbane Qld 4001
general.enquiries@qca.org.au
www.qca.org.au

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SUBMISSIONS

Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (the Authority). It therefore invites submissions from interested parties concerning the development of an efficiency carryover mechanism.

Written submissions should be sent to the address below. While the Authority does not necessarily require submissions in any particular format, it would be appreciated if two printed copies could be provided together with an electronic version on disk (Microsoft Word format) or by e-mail. Submissions, comments or inquiries regarding this paper should be directed to:

Queensland Competition Authority
GPO Box 2257
Brisbane QLD 4001

Attention: Gary Henry

Telephone: (07) 3222 0555
Fax: (07) 3222 0599
Email: energy@qca.org.au

The **closing date** for submissions is 22 October 2004.

Confidentiality

In the interests of transparency and to promote informed discussion, the Authority would prefer submissions to be made publicly available wherever possible. However, if a person making a submission does not want that submission to be public, that person should claim confidentiality in respect of the document (or any part of the document). Claims for confidentiality should be clearly noted on the front page of the submission and the relevant sections of the submission should be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two copies of each version of these submissions (ie the complete version and another excising confidential information) could be provided. Again, it would be appreciated if each version could be provided on disk. Where it is unclear why a submission has been marked “confidential”, the status of the submission will be discussed with the person making the submission.

While the Authority will endeavour to identify and protect material claimed as confidential as well as exempt documents (within the meaning of the *Freedom of Information (FOI) Act 1989*), it cannot guarantee that submissions will not be made publicly available. As stated in s187 of the *Queensland Competition Authority Act 1997* (the QCA Act), the Authority must take all reasonable steps to ensure the information is not disclosed without the person’s consent, provided the Authority is satisfied that the person’s belief is justified and that the disclosure of the information would not be in the public interest. Notwithstanding this, there is a possibility that the Authority may be required to reveal confidential information as a result of an FOI request.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at the Brisbane office of the Authority, or on its website at www.qca.org.au. If you experience any difficulty gaining access to documents please contact the office (07) 3222 0555.

Information about the role and current activities of the Authority, including copies of reports, papers and submissions can also be found on the Authority’s website.

1. INTRODUCTION

The Queensland Competition Authority has various responsibilities in relation to the economic regulation of essential infrastructure in Queensland. Some of these responsibilities result from national Codes (for example, electricity and gas distribution), some result from the declaration of essential infrastructure under the *Queensland Competition Authority Act 1997* (for example, certain rail and port infrastructure) while others result from referrals to the Authority under the QCA Act in respect of infrastructure that has not been declared (for example, Gladstone Area Water Board).

The National Electricity Code requires that the pricing regime adopted by the Authority must seek to achieve an incentive-based regulatory regime which,

‘... provides an equitable allocation between Distribution Network Users and Distribution Network Owners of efficiency gains reasonably expected by the Jurisdictional Regulators to be achievable by the Distribution Network Owners ...’ (Clause 6.10.2(b)(1)).

The National Gas Code requires that, wherever appropriate, a reference tariff policy contain mechanisms which permit the service provider to retain all or part of any returns in excess of those expected at the beginning of the access arrangement period, particularly where those returns are attributable to the efforts of the service provider. At the same time, the Gas Code also recognises that users should share in the benefits which arise as a result of increased efficiency, innovation and the volume of sales, although this need not occur in the access arrangement period during which such efficiencies were achieved.

In its various determinations, the Authority has aimed to achieve outcomes which are consistent with a properly functioning competitive market. This has resulted in the adoption of an incentive based regulatory regime, which encourages service providers to increase the efficiency of their operations while at the same time recognising that, in a properly functioning competitive market, those efficiency gains would be shared over time with users.

To the extent that it is desired to recognise the efficiency gains over more than one regulatory period, an efficiency carryover mechanism is required. This issue is particularly relevant at this time as a number of the Authority’s determinations are due for review and an element to be considered will be what efficiency gains were achieved during the expiring regulatory period and how the gains should be shared between the service provider and the users.

The purpose of this paper is to provide an overview of the issues relevant to the consideration of an appropriate efficiency carryover mechanism and to seek comment from interested parties on these issues.

2. RATIONALE FOR AN EFFICIENCY CARRYOVER MECHANISM

2.1 Incentive Regulation

Implicit in incentive regulation is the notion that gains for all parties are possible if the business can be encouraged to increase the efficiency and effectiveness of its operations. Typically, this is achieved by encouraging the regulated business to out-perform a predetermined benchmark level of efficiency by allowing it to retain all or part of the benefit from doing so for some period of time.

However, the incentive to out-perform the predetermined benchmark may be undermined if the regulated business believes its efforts will be insufficiently rewarded and the benefits immediately returned to customers at the end of the regulatory period. The shorter the regulatory period or the further into an existing regulatory period, the greater this potential disincentive.

Consideration of an efficiency carryover mechanism is only concerned with the treatment of gains across regulatory periods. Without an efficiency carryover mechanism of some kind, any savings generated by the business during one regulatory period will be passed on to customers in the form of lower prices (than would otherwise apply) immediately at the start of the next regulatory period.

An efficiency carryover mechanism should provide a regulated business with an ongoing incentive to operate efficiently throughout the entire regulatory period. In the absence of a continuous incentive, there is a risk that a regulated business will target efficiency gains in the early years of a regulatory period and/or defer introducing cost savings towards the end of the regulatory period, with a view to maximising the period over which these gains can be retained. The potential to time the introduction of efficiency gains to correspond with a regulatory period may not only conflict with a business's assessment of the best time to introduce cost-saving measures but may also jeopardise service quality for customers in the short-term.

An efficiency carryover mechanism can also be designed to provide a regulated business with balanced incentives for the type of efficiencies undertaken, leaving the regulated business indifferent between pursuing efficiency gains in operating expenditure or capital expenditure.

3. DEFINITION OF EFFICIENCY GAINS

The efficiency benchmark set at the beginning of a regulatory period establishes the level of performance that a regulated business could reasonably be expected to achieve over that period. A business' actual performance relative to the benchmark will reflect the combined impact of factors both within, and outside, its direct control.

Support for an efficiency carryover mechanism only extends to the carry forward of those gains that have been generated by the business' own efforts. In other words, the efficiency carryover mechanism should only target efficiency gains and not apply to windfall gains or other fortuitous cost savings. This is because an efficiency carryover mechanism is meant to correct for any unintended negative impacts on business decision making resulting from the period-by-period regulatory process not simply to reward cost reductions however achieved.

Moreover, in a properly functioning competitive market, windfall gains are likely to be passed on to consumers relatively rapidly, as these benefits will be available to all competitors and hence reduce costs for everyone, whereas management initiated efficiency gains are likely to be unique to the particular business and hence provide a source of competitive advantage that the business will be able to maintain until competitors are able to extract similar efficiency gains.

3.1 Windfall and Efficiency Gains

A windfall gain is a reduction in a regulated business' costs of production that has resulted from factors external to the business. For example, interest rates may turn out to be lower than those built into the original cost forecasts or favourable weather conditions could have the effect of lowering operating costs. The resulting cost savings represent a windfall to the business but do not reflect any conscious effort on the part of the regulated business, or an active decision making process, to achieve such an outcome.

Conversely, an efficiency gain is a cost saving that is a direct result of a management induced initiative intended to achieve such a cost saving. For example, management decisions to introduce new labour saving methods or improved asset management and maintenance practices could deliver a lower cost structure for the business and hence an efficiency gain. Such gains will not be transitory or one-off but will deliver long-term savings by lowering the ongoing cost structure of the business. The value of the saving would be represented by the net saving to the business and it would be necessary to establish that a cost saving in one area did not come at the expense (now or in the future) of higher (or even equivalent) additional cost in another area. For example, while management could decide to embark on a specific strategy to reduce operating costs, this may simply lead to higher capital costs, lower service quality or higher operating costs in the future. While the direct cause of the cost saving would meet the initial criteria, none of these outcomes would be considered an efficiency gain.

The difficult issue then becomes how to separately identify efficiency gains that may potentially be carried forward from windfall gains external to the business, short-term cost savings or simple underspends on particular activities, none of which warrant any form of carry forward.

One approach to this issue might be to disregard the source of the cost saving but allow a less than full carryover. This approach would recognise that some part of the costs saved will not be efficiency gains. The advantage of such an approach would be its simplicity. The disadvantage would be that there could be no guarantee that the business was being appropriately rewarded (either too much or too little) for efficiency gains created within the business. It could also give rise to unproductive gaming behaviour as it might be possible for the business to gain significant advantage by generating paper savings without changing the underlying cost structure of the business. In such cases, apparent gains in one period would continue to be rewarded in the next while the source of the gains may have evaporated.

While such an approach offers a simple and pragmatic solution, determining the appropriate proportion of cost savings to be carried forward is likely to be arbitrary and difficult to justify.

The extent to which efficiency gains can be achieved is also likely to differ between regulated industries due, in part, to the different pace of technological progress in each sector and the speed with which new technology can be utilised by individual service providers. This differing potential for efficiency gains would also need to be taken into consideration in setting the carry forward ratio if a less than full carryover mechanism was adopted.

An alternative approach might be to require the business to clearly establish what part of any identified cost savings were the result of explicit management decisions and that the cost savings would be maintained in the future. The advantage of this approach is that only efficiency gains would be rewarded and there would be certainty for consumers that the benefits of such savings would pass to them at some future time. The disadvantage of such an approach is that it would, of necessity, be a somewhat intrusive process requiring a case, supported by clear evidence, to be presented by the business for each efficiency gain claimed.

Between these two extremes there may be possible compromises that would provide more acceptable outcomes. Alternatively, the compromises necessary may diminish the positive benefits for either or both parties (service providers and consumers) to the extent that it may be better to simply not introduce an efficiency carryover mechanism in the first place.

The Authority seeks comments on:

- **whether an efficiency carryover mechanism is seen as desirable;**
- **an appropriate means of identifying efficiency gains;**
- **the desirability of restricting consideration of any carryover to explicitly identified efficiency gains as opposed to some more broad approach; and**
- **the proportion of cost savings that might reasonably be subject to carryover if a more broad recognition of savings is adopted. Would this vary depending on the particular industry?**

4. EFFICIENCY CARRYOVER DESIGN

If a carryover mechanism were to be included in the regulatory arrangements, there are a number of matters to be considered regarding its design.

4.1 Measuring Efficiency Gains

Efficiency gains could be measured on a cumulative or an incremental basis.

Table 1 illustrates this point. It assumes that the forecast operating and maintenance costs for a five year regulatory period were \$100 million per year but that actual expenditure differed from that forecast solely as a result of efficiency gains. Over the regulatory period, the difference between forecast and actual costs was \$65 million. This is the efficiency gain during the regulatory period measured on a cumulative basis and is the sum of the individual gains and losses for each year of the regulatory period. If a cumulative approach to efficiency gains is adopted, a total efficiency gain of \$65 million would be shared between the service provider and users over the next 5 year review period.

However, on a forward looking basis, the efficiency gain is \$30 million per annum. This is the efficiency gain during the regulatory period measured on an incremental basis and is the sum of the annual variations in the gains and losses over the regulatory period. If an incremental approach to efficiency gains is adopted, a total efficiency gain of \$150 million (5 years x \$30 million per annum) would be shared between the service provider and users over the next 5 year review period.

Table 1: Calculation of Operating Gains/Losses (\$ million)

Year	1	2	3	4	5	Total
Forecast Expenditure	100	100	100	100	100	500
Actual Expenditure	100	90	95	80	70	435
Incremental Opex Gain/Loss	0	10	(5)	15	10	30
Cumulative Opex Gain/Loss	0	10	5	20	30	65

The cumulative approach to efficiency gains is backward looking and has no regard for the level of efficiency reached at the end of the regulatory period. This contrasts with the incremental approach which is clearly forward looking. It is for this reason that operating and maintenance expenditure efficiencies are generally calculated using an incremental approach.

Under either approach, the business will generally retain the full benefit of any savings made during a regulatory period for the remainder of the regulatory period while customers continue to pay prices based on the higher forecast level of expenditure.

The Authority seeks comments on the most appropriate basis for measuring efficiency gains.

4.2 Type of Carryover Mechanism

There are two approaches that are commonly used to carryover efficiency gains (losses) obtained in one regulatory period into a subsequent period. These are a glide path and a rolling carryover. The essential difference between these two mechanisms is one of timing. It

concerns both the point in time that gains are identified and the basis on which the benefits of those gains are retained by the business (until passed to the consumer).

Glide Path

A glide path allows for identified savings to be passed to consumers in a staged manner over time. For example, if it were to be determined that benefits were to be passed to customers over a five year period, a glide path could be used to allocate a proportion of those benefits to consumers in each of those five years. Table 3 shows how this might be achieved.

Table 3: Operating Cost Glide Path Mechanism (\$ million)

Year	1	2	3	4	5	6	7	8	9	10
Forecast Expenditure	100	100	100	100	100	70	70	70	70	70
Actual Expenditure	100	90	95	80	70					
Underspend (Overspend)	0	10	5	20	30					
Incremental Efficiency Gain		10	(5)	15	10					
Percentage of Gains (Losses) Retained by business						100%	80%	60%	40%	20%
Efficiency Carryover						30	24	18	12	6
Retained Efficiencies		10	5	20	30	30	24	18	12	6
Expenditure used for pricing purposes	100	100	100	100	100	100	94	88	82	76

From Table 3 it can be seen that the incremental efficiency gain of \$30 million achieved over the first five year regulatory period is passed back to customers over the following five years of the next regulatory period according to a preset path. The expenditure forecasts for the second regulatory period have been adjusted to reflect the efficient (lower) costs established by the end of the first regulatory period but the business retains a decreasing proportion of the benefit of past savings initiatives through to the end of the second regulatory period.

Because there is no necessary link between the manner in which savings are achieved in the first regulatory period and the rate at which they are handed on to customers, a glide path will not necessarily eliminate all the timing issues associated with efficiency gains as the business can still achieve a greater benefit by strategically biasing its savings initiatives towards the front of the regulatory period.

In the second regulatory period (as with the first) the business would also benefit from any further cost savings achieved during the second period and the benefit of these would then carry-over into the third regulatory period.

Rolling Carryover

A rolling carryover mechanism allows efficiency gains to be retained by the regulated business for a set period of time, irrespective of the year in which they occurred. Once the retention period has expired, gains would normally be passed on to consumers in a one-off price reduction, but this could also be phased in over time.

Table 4 shows how a rolling carryover mechanism might operate, assuming gains (losses) are retained for a period of five years beyond the year in which they were achieved.

Table 4: Rolling Carryover Mechanism (\$ million)

Year	1	2	3	4	5	6	7	8	9	10
Forecast Expenditure	100	100	100	100	100	70	70	70	70	70
Actual Expenditure	100	90	95	80	70					
Underspend (Overspend)	0	10	5	20	30					
Incremental Efficiency Gain (Loss)	0	10	(5)	15	10					
Efficiency Carryover										
Year 1	-	0	0	0	0	0				
Year 2	-	-	10	10	10	10	10			
Year 3	-	-	-	(5)	(5)	(5)	(5)	(5)		
Year 4	-	-	-	-	15	15	15	15	15	
Year 5	-	-	-	-	-	10	10	10	10	10
Retained Efficiencies	0	10	5	20	30	30	30	20	25	10
Expenditure used for pricing purposes	100	100	100	100	100	100	100	90	95	80

The major advantage of a rolling carryover mechanism is that it eliminates the timing issue (in nominal terms at least) from the decision making process. Regardless of when an efficiency gain is introduced or achieved, the benefits will be retained for the same period of time. In this way, it provides a continuous incentive for businesses to seek efficiencies throughout the regulatory period. The mechanism also provides transparency in terms of the number of years and the proportion of any cost savings that can be retained by the business on an ex ante basis.

One disadvantage of a rolling carryover mechanism is the level of detail that may be required in order to track efficiency gains across the years. There is also the chance that, due to the unpredictable annual adjustments that would be required with new gains being included and some old gains being removed, a degree of volatility would be introduced into the business' allowed revenue. However, price smoothing should overcome any such impacts.

The Authority seeks comments on the most appropriate form of efficiency carryover mechanism.

4.3 Sharing Ratio

In designing an efficiency carryover mechanism, a key consideration is the time over which the regulated business will be allowed to retain the benefits of those efficiency gains, recognising that, the longer this period, the greater the delay before customers also enjoy the benefits of improving efficiency. At the same time, if the period is too short, there may be insufficient incentive to encourage businesses to seek efficiency gains. The choice of retention period needs to be assessed in terms of this trade-off and determined so as to provide sufficient incentive for the business to continue to pursue sensible efficiency improvements while providing customers with reasonable access to the benefits of such activity.

The implied sharing ratio associated with an efficiency carryover mechanism can be derived from the ratio of the net present value of a given gain for a given number of years to the value of that gain retained in perpetuity.

There is no ideal or ‘optimal’ sharing ratio of efficiency gains. The ratio largely depends on assumptions about the responsiveness of a regulated business’ management to changes in the share of gains it can retain. If the business is likely to react strongly to receiving a greater share of the benefits (via a longer retention period) it may be appropriate to extend the retention period (as the increased efficiency gains pursued by the business would provide greater total benefits to both business and customer over time). If the business is unlikely to react particularly favourably in response to receiving a greater share of the benefits, then it may be preferable to return existing gains to customers over a shorter period of time.

Decisions by the ESC (2002) and ACCC (2002) adopted a sharing ratio of 30:70 per cent in favour of customers, believing this would provide adequate incentive for further productivity improvement by the business. This ratio was achieved by allowing the businesses to retain additional gains for five years beyond the year in which they occurred.

Regulated businesses have argued that a 50:50 sharing ratio, and hence a ten year retention period, is appropriate on the grounds that it is ‘fair’ and that it would lead to benefits to consumers being maximised in the long term.

The Authority is aware of empirical evidence that the period of above normal returns in actual competitive markets is generally limited to a maximum of five years:

- a study of 46 major product innovations found that the average time until entry by a competing product was around 3.4 years (Agarwal & Gort, 2001);
- a study of 500 brands in 50 product categories showed that market leadership ‘does not appear to last very long’ and the median period of leadership was only five years (Golder & Tellis, 1993); and
- even patented innovations are quickly imitated – a study of 48 successful patented product innovations from firms in chemical, drug, electronics and machine industries showed that the majority were imitated within four years (Mansfield et al, 1981).

The Authority seeks comments on what might be an appropriate sharing ratio of efficiency gains and hence an appropriate retention period for the distributors to retain the benefits of efficiency gains.

4.4 Symmetrical Treatment of Gains and Losses

While a business can achieve efficiency gains over the regulatory period, it is also possible for efficiency losses to occur and accumulate. In terms of the earlier discussion regarding the

identification of efficiency gains, it is unlikely that management would initiate direct action to achieve an efficiency loss. Nevertheless, efficiency losses do occur. These might result from management initiatives which fail to achieve the intended outcome or perhaps as a consequence of addressing a particular business issue, some loss of operating efficiency might be an unavoidable outcome. How efficiency losses are to be treated in terms of a carryover mechanism needs to be considered.

One issue is whether it is appropriate to treat efficiency gains and losses symmetrically within a regulatory period. That is, to require any losses incurred in one year to be offset against efficiency gains in a subsequent year. This seems to be a non-issue as within any regulatory period the business will enjoy the benefits of any cost savings and incur the costs of any cost overruns. In calculating any efficiency gain within that period, offsetting gains and losses would appear only reasonable.

The second issue is whether it is appropriate to carryover net losses incurred in one regulatory period to a subsequent regulatory period. On the one hand, carrying over net losses should encourage a regulated business to maintain efficient performance throughout the entire regulatory period (for the same reasons that allowing gains to be carried forward will encourage efficient outcomes – the carrot and the stick). On the other hand, any carry forward of net losses will reduce the amount of revenue potentially available to the business below that which the regulator has deemed necessary for the provision of prescribed services.

Within the regulatory period, the business will be required to finance any cost overruns and consumers will be no worse off as their prices will remain based on the (lower) original forecasts. If a net loss accumulated over a regulatory period is not carried forward, the business will be relieved of any penalty associated with its past performance and customers will be required to pay increased prices due to the business's past inefficiency. Not adopting a symmetrical approach would therefore see customers continuing to pay higher prices when a business makes an efficiency gain and having to pay higher prices when a business makes an efficiency loss (a lose-lose situation for the customer).

However, it could also be argued that requiring a business to carry forward accumulated losses may not only penalise the business but may also penalise the customer as the business may be forced (or elect) to run down service quality rather than undertake the necessary investment in its infrastructure in the face of less than sufficient revenues.

Should efficiency losses accumulate to a significant size, carrying forward losses could potentially threaten the financial viability of the business in a subsequent regulatory period. This could also be counter productive if, due to the definition of efficiency gains, the efficiency loss simply reflected a share of total losses caused by circumstances external to the business, for example, unforeseen and rapidly rising demand (this would not be an issue if efficiency gains and losses were being explicitly identified and valued).

A compromise might be to set to zero any carryover between periods where the amount would otherwise be negative or for the Authority to exercise some discretion in determining the treatment of negative carryover amounts based on the specific reasons for that result and the likely financial impact on the regulated business.

Other regulators have adopted differing positions on this issue. The ESC (2000a, 2002) and ESCoSA (2003) have both (at some stage and for differing reasons) opted to set negative amounts to zero. The ACCC (2002) felt the benefits to users and efficiency of an automatic negative carryover was likely to outweigh the short-term harm to the service provider.

The Authority seeks comments on the symmetrical treatment of efficiency gains and losses in the context of any proposed efficiency carryover mechanism.

4.5 Expenditure Neutrality

An efficiency carryover mechanism should aim to treat any cost savings made in relation to either operating expenditure or capital expenditure in the same way in order to provide balanced incentives for the regulated businesses to pursue efficient costs in both types of expenditure. In this way, the mechanism would not distort the incentives facing the regulated business to adopt the most efficient (least-cost) combination of operating and capital expenditure.

To achieve such an outcome, the efficiency carryover mechanism would need to provide for the regulated business to keep an equivalent portion (in net present value terms) of any cost savings, regardless of where the cost savings occurred.

In the absence of such equal treatment, a business could be encouraged to capitalise operating costs through the reclassification of operating and maintenance expenditure as a capital cost or by undertaking capital expenditure when operating expenditure might represent the most efficient option. It is difficult to anticipate the likely strength of these incentives. While it is generally accepted in many regulated industries that there is a trade-off between operating and capital expenditure, it is difficult in practice to accurately measure the relationship.

To avoid the potential for this bias, UK regulators have sought to investigate the benchmarking of a total cost measure of delivering outputs.

To date, the Authority has only contemplated the carryover of operating cost efficiency gains. However, should the scope for efficiency carryover be extended to capital expenditure, the use of some form of composite index capturing both capital and operating efficiency gains may be appropriate. Even without including capital efficiency gains in any carryover mechanism, it may be necessary to adopt this type of analysis when considering operating cost savings in order to address the bias that may otherwise be created in favour of pursuing savings in operating costs at the expense of rising capital costs.

However, there are other mechanisms within the regulatory arrangements that may already ensure that capital expenditure is efficient and timely. In rolling forward the asset base between regulatory periods, the Authority already has the capacity to ensure that only prudent expenditure is wound into the capital base.

The Authority seeks comments on the merits of, and extent to which it is practical to establish, expenditure neutrality as part of an efficiency carryover mechanism.

4.6 Service Quality

Any consideration of efficiency carryover cannot be made in isolation from other aspects of the regulated business' performance. Cost cutting in one area of a business can have serious consequences for costs in other areas and/or the quality of outputs.

Under the current regulatory regime, there is an opportunity for a regulated business to trade-off service quality in favour of (short-term) profitability by, for example, cutting back on necessary maintenance or investment. Eventually such decisions will lead to declining levels of service quality but, in the short-term, may appear to be efficiency gains due to targeted cost savings.

If an efficiency carryover mechanism is to be introduced, it would be essential to ensure that the regulated business was not able to be rewarded for such short-term cost savings and hence that customers may in effect be required to pay (by continuing to pay higher prices during the extended retention period) for a benefit they never received (because by the time the benefit is due to be passed on to customers, the cost savings have evaporated or turned into cost increases

as previous under-expenditure now has to be undertaken anyway). It would be essential to ensure that any reductions in costs are not made at the expense of service quality.

Of equal concern is the opposite outcome. The regulated business might invest in service quality improvements that could have the appearance of cost increases and hence a loss of efficiency. Were the carryover mechanism not capable of identifying such outcomes, or at least accommodating them should they become apparent, it could create a disincentive for investment in what might otherwise be seen by customers as being worthwhile improvements in service quality.

One of the problems that arises here is how to make an assessment that a trade-off has actually occurred, given the link between the costs of providing a service and the quality of service delivered is not necessarily clear nor immediate.

Where it can be established that a change in service quality has occurred, there may be a need to adjust any efficiency gains applicable to that period. This raises a number of issues, including:

- on what basis an adjustment could be made (for example, an adjustment to the original forecasts to account for additional expenditure which has resulted in an improvement in service quality); and
- whether adjustments should be made on an asymmetrical (for worsening service quality only) or symmetrical basis (both for a deterioration or improvement in service quality).

In 2003, the Authority released a report by Meyrick & Associates and Pacific Economics Group on a possible service quality incentive framework (Meyrick et al, 2003). That report noted that, while it is possible for an efficiency carryover mechanism to operate in conjunction with a service quality incentive scheme, there are potentially interacting links between the two mechanisms.

For one thing, new and improved distribution equipment and work methods may simultaneously improve both efficiency and reliability. Under these circumstances, a service provider could benefit through an efficiency gain and service quality incentive reward, allowing them to effectively double dip. Meyrick went on to say that some regulators have expressed concern that service providers may face incentives to run the system down and reduce service quality unless the benefits from both incentive schemes are retained for the same period of time. This is because the benefits from reducing costs under a multi-period efficiency carryover mechanism may outweigh a single period service quality incentive reward.

The Authority seeks comments on the appropriate treatment of changes in service quality in the calculation of an efficiency carryover amount.

5. OTHER JURISDICTIONS

5.1 Australian Competition and Consumer Commission

In its *Draft Principles* (ACCC, 1999), the Commission indicated that it would make adjustments for gains and losses at the end of each regulatory period in relation to:

- the rate of return – a full P_0 adjustment;
- operations and maintenance expenditure – a straight line glide path, whereby efficiency gains beyond the X-factor are gradually shared at a rate of 20 per cent per year; and
- capital expenditure – a full P_0 adjustment. However, transmission network service providers were invited to demonstrate to the Commission that capital efficiencies had occurred as a result of management-induced strategies. In these circumstances, such gains may be subject to a glide path.

In its Discussion Paper on the *Review of the Draft Statement of Principles* (ACCC, 2003), the Commission indicated its preferred position was to adopt an incentive mechanism that creates constant incentives for efficiency over time. As part of its review, the Commission sought comments on a number of issues related to incentive mechanisms. The review is yet to be finalised.

GasNet Decision

In relation to the efficiency gains accumulated in the first access arrangement period, the Commission (ACCC, 2002) decided that:

- there was to be no carryover of capital expenditure efficiency gains (that is, a P_0 adjustment would apply); and
- a straight-line glide path was appropriate for the carryover of operating and maintenance gains given this model was flagged at the commencement of the first regulatory period.

In subsequent regulatory periods, a P_0 adjustment would apply to capital expenditure. For operations and maintenance expenditure, the Commission considered that a rolling carryover mechanism provided a more appropriate form of incentive. The main features of the operating and maintenance expenditure carryover mechanism were:

- unanticipated efficiency gains (losses) would be retained for the year in which they occur plus an additional five years;
- both unanticipated gains and losses would be carried over – the Commission considered that while an automatic negative carryover may harm the interests of GasNet in the short-term, this was outweighed by the benefits to users and efficiency;
- final year (t) expenditure will be determined by adjusting (t-1) actual expenditure by the forecast change in expenditure between these years;
- no allowance would be made for volume growth as it was considered that the costs associated with increased volumes was likely to be small for a transmission network;
- an adjustment would be made to second period forecast costs to remove any positive or negative passthrough events; and

- a downward adjustment would be made to second period forecasts to account for regulatory review costs, given these were allowed in the benchmark revenues for 2003 but incurred in the two previous years.

East Australian Pipeline Ltd (EAPL) Decision

The Commission (ACCC, 2003) accepted the P_0 adjustment proposed by EAPL. However, the Commission noted that it considered a rolling carryover mechanism to be more appropriate and was prepared to assess such a mechanism should EAPL propose one in its revised access arrangement in response to the Final Decision.

5.2 New South Wales

The Tribunal (IPART, 2004) decided not to introduce a fixed-term efficiency carryover mechanism for the 2004 electricity distribution regulatory period on the basis that the costs associated with its establishment would outweigh the benefits. Instead, the Tribunal opted to continue the approach to efficiency carryover established in its 1999 Determination, which is a hybrid P_0 /straight line form of revenue smoothing.

The Tribunal noted that some of the distributors had expressed concern about the level of complexity and confusion that might arise if it were to introduce a fixed-term efficiency carryover mechanism at the same time as moving to a weighted average price cap. However, the Tribunal flagged its intention to assess the case for introducing such a mechanism in the next regulatory period.

In the case of gas distribution, the Tribunal (IPART, 2002) indicated that it would decide whether additional efficiency gains would be retained by service providers over the next regulatory period at the next access arrangement review. The Tribunal is expected to release its Draft Decision on the proposed access arrangement revisions for AGL Gas Networks and Country Energy Gas in November 2004.

5.3 Victoria

The details of the ESC's incentive mechanism to apply to electricity distributors post-2001 are as follows:

- the carryover mechanism will focus on the difference between benchmark forecasts and outturn expenditure in relation to operating and maintenance and capital costs only;
- an efficiency gain (loss) in each year of the regulatory period is calculated as:
 - for operating and maintenance expenditure, the reduction (increase) in the level of recurrent expenditure compared to the benchmark forecast expenditure for that year;
 - for capital expenditure, the difference between actual and the original forecast benchmark expenditure multiplied by the regulatory WACC. No adjustment will be made to account for differences in depreciation;
- efficiency gains (losses) will be retained by the distributor for five years after the year in which the efficiency was achieved. This implies a sharing ratio of around 30:70 in net present value terms;

- symmetrical treatment of efficiency gains and losses with combined gains (or losses) calculated for operating and maintenance expenditure and capital expenditure;
- where the combined opex and capex carryover is negative, the efficiency carryover will be set to a floor of zero for that year and the implied negative amount will be used to offset any positive gain in the following year;
- implied negative values will be carried over and accrued in each year, until the end of the regulatory period;
- any accrued negative carryover amount at the end of the regulatory period will be taken into account in setting benchmarks for the following regulatory period;
- the efficiency gain (or loss) for the last year of the regulatory period will be assumed to be zero; and
- in setting benchmarks for the following regulatory period:
 - benchmark operating expenditure for the first year (t) is set as the assumed outcome for year t-1; and
 - benchmark capital expenditure for the first year is set assuming no efficiency gains in year t-1 in excess of that implied by the original benchmarks. Any difference between the t-1 benchmark and actual capital expenditure in t-1 will be corrected for at the start of the following regulatory period.

The ESC (ESC, 2000a) initially took the position that there would be no reopening of the original opex and capex expenditure benchmarks except to account for changes to the legislative obligations placed on the electricity distributors. This meant that there was to be no adjustment to reflect any difference between actual and forecast demand. However, as a result of an appeal by four of the five Victorian distributors, the Appeal Panel resolved that the benchmarks should be adjusted for the impacts of demand growth and that the efficiency carryover be recalculated on the basis of the new figures.

The rolling carryover mechanism applied to the electricity distributors was also adopted by the Commission for the Victorian gas distribution businesses.

For the initial access arrangement period, the Commission (ESC, 2002) resolved not to apply a negative carryover going into the second period, particularly since two of the three distributors were unable to meet the proposed benchmarks. As a result, a zero carryover was applied to these distributors. In future, the Commission will retain discretion in determining the treatment of accrued negative carryover amounts at the end of future access arrangement periods.

In the next access arrangement period, the Commission has indicated it will adjust the expenditure benchmarks at the end of the regulatory period to take account of changes in growth. The adjustments will be made on the basis of pre-established capital expenditure and operating and maintenance expenditure estimates per new connection.

5.4 South Australia

ESCoSA (2003) provided its working conclusions on key aspects of the efficiency carryover mechanism which will feed into the 2005 electricity price review as follows:

- efficiencies in both operating and capital expenditure will be considered;

- operating expenditure efficiencies will be calculated using an incremental approach and capital expenditure efficiencies will be calculated using an annual approach;
- depreciation will not form part of the capital expenditure efficiency calculation;
- there will be no differentiation between management-induced and external efficiencies;
- adjustments to the benchmark costs will be made where there have been material changes to costs due to passthrough events approved by ESCoSA. There will be no adjustment to account for differences between forecast and outturn growth;
- a rolling carryover mechanism will be adopted for efficiencies generated in the initial regulatory period;
- efficiency gains or losses will be retained by ETSA Utilities for five years following the year in which they occurred;
- efficiency gains and losses will be treated symmetrically;
- for the initial regulatory period, if a net negative carryover results, the carryover amount will be set to zero;
- the mechanism will not incorporate any additional factor to address a bias against making on-going savings in capital expenditure;
- for operating expenditure, it will be assumed that year five expenditure is equal to year four expenditure multiplied by the change in efficiency embodied in the original expenditure benchmarks between those years. This operating expenditure level will then determine the cost benchmark for the start of the subsequent regulatory period;
- year five capital expenditure will be assumed to be equal to the benchmark level for that year and the asset base rolled forward on this basis. An adjustment to the asset base at the start of the subsequent regulatory period will be made to account for any difference between actual and benchmark capital expenditure in the final year;
- historical cost information will form the starting point for future expenditure benchmarks. Adjustments will be made by considering factors such as external benchmarking and cost driver analysis; and
- the intention is to continue to apply the same form of carryover mechanism in the subsequent regulatory period with the exception that the appropriate treatment of any negative efficiency carryover amount would be considered at the time of the next review.

For gas distribution, SAIPAR (2001) approved a cross-period incentive mechanism that enabled Envestra to retain 100 per cent of any returns (controllable or non-controllable) from the sale of reference services over and above the level of efficiency gains achieved. The mechanism would apply for two access arrangement periods, although estimates of non-capital costs, gas sales and other relevant estimates were to be re-examined at each access arrangement review.

5.5 Australian Capital Territory

In its Draft Electricity Distribution Decision (ICRC, 2003), the Commission decided not to apply an efficiency carryover mechanism to efficiency gains obtained in the current regulatory period as it did not believe that a retrospective mechanism was consistent with the principles of

minimising uncertainty and regulatory risk. However, the Commission signalled its intention to develop a mechanism that would apply to efficiency gains made in the next regulatory period, possibly involving a rolling carryover approach.

In its Final Decision on electricity pricing (ICRC, 2004), the Commission reaffirmed its commitment to consider the introduction of incentive mechanisms relating to efficiency gains and service standards.

In its Draft Decision on the gas access arrangements (ICRC, 2004a), the ICRC noted that ActewAGL had not proposed a formal efficiency carryover mechanism or any link between service standards and prices. However, ActewAGL had indicated its willingness to work with the Commission to develop such a mechanism to apply in the forthcoming access arrangement period.

5.6 Northern Territory

The Utilities Commission (Utilities Commission, 2003) decided that any out-performance in the second regulatory period (2004-2009) should be carried forward in accordance with a gains sharing approach during the third regulatory period, but is yet to decide on the detail of that approach.

5.7 Tasmania

The Office of the Tasmania Energy Regulator (OTTER, 2003) noted that Aurora Energy did not achieve productivity savings above those provided for in the 1999 Electricity Determination. Therefore, consideration of a specific carryover mechanism was not required in moving to the next regulatory period. However, OTTER proposed that Aurora Energy be able to retain 100 per cent of any additional savings (beyond the required 1 per cent improvement per annum) in operating and maintenance expenditure for five years from 2005.

5.8 Western Australia

The Economic Regulation Authority released a Discussion Paper on *Incentive Mechanisms for Code Regulated Gas Pipeline Systems* (ERA, 2004). Among other things, the paper discusses the potential for a carry-forward form of benefit-sharing arrangement.

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