



independent competition and regulatory commission

Final Decision
**Review of Efficiency and
Service Standard Incentive
Mechanisms**
Report 16 of 2005
December 2005

The Independent Competition and Regulatory Commission (the Commission) was established by the *Independent Competition and Regulatory Commission Act 1997* (ICRC Act) to determine prices for regulated industries, advise government about industry matters, advise on access to infrastructure and determine access disputes. The Commission also has responsibilities under the Act for determining competitive neutrality complaints and providing advice about other government-regulated activities.

The Commission has three commissioners:

Paul Baxter, Senior Commissioner
Robin Creyke, Commissioner
Peter McGhie, Commissioner.

Submissions, correspondence or other enquiries may be directed to the Commission at the addresses below:

The Independent Competition and Regulatory Commission
PO Box 975
CIVIC SQUARE ACT 2608

Level 7 Eclipse House
197 London Circuit
CIVIC ACT

The secretariat may be contacted at the above addresses, by telephone on 6205 0799, or by fax on 6207 5887. The Commission's website is at www.icrc.act.gov.au and its email address is icrc@act.gov.au or ian.primrose@act.gov.au.

For further information on this investigation or any other matters of concern to the Commission, please contact Ian Primrose, Chief Executive Officer, on 6205 0779.

Foreword

The Independent Competition and Regulatory Commission (the Commission) is responsible for the regulation of monopoly distribution networks in the ACT. These include ActewAGL's electricity and gas networks, as well as ACTEW's water and wastewater network.

In the regulation of these monopoly distribution networks, the Commission is responsible for conducting periodic reviews to determine the revenue requirement for each utility. During 2004, the Commission completed reviews into all three distribution networks.

In completing these reviews, the Commission discussed with ACTEW and ActewAGL the possibility of introducing an efficiency carryover mechanism and/or a service incentive scheme. Both businesses committed to working with the Commission in an attempt to evaluate the likely benefits of such an introduction.

The Commission released a discussion paper as the first step in consulting interested parties on the possible introduction of such a mechanism or scheme. The discussion paper (*Incentive mechanisms*, Report 3 of 2005) was released in March 2005. Following submissions on the discussion paper, the Commission released a draft decision in August 2005 (*Review of efficiency and service standard incentive mechanisms*, Report 5 of 2005).

A joint submission on the draft decision was received from ACTEW and ActewAGL. The ACT Council of Social Service (ACTCOSS) also provided comments.

The Commission considered these submissions before coming to the conclusions contained in this final decision.

Paul Baxter
Senior Commissioner
December 2005

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1 Introduction

The Independent Competition and Regulatory Commission (the Commission) released its final decisions on electricity distribution prices and water and wastewater service prices in March 2004 and on gas distribution prices in November 2004.¹

In the process of conducting these investigations, the possibility of introducing some form of efficiency carryover mechanism and/or a service quality incentive scheme was raised.

While the Commission decided against adopting either an efficiency carryover mechanism or a service incentive scheme for the current regulatory periods, the Commission committed to investigating the potential benefits of the introduction of such a mechanism or scheme in the future. Both ACTEW Corporation Limited (ACTEW) and ActewAGL Distribution (ActewAGL), the regulated businesses operating in the ACT, stated a willingness to work with the Commission in determining whether the introduction of either system would lead to greater efficiency. The Commission notes the differences between the water and wastewater, gas and electricity distribution networks and acknowledges that, in a practical sense, these differences may require the adoption of tailored mechanisms.

A service incentive scheme aims to create a link between service quality and revenues. Currently, there is little incentive for a regulated distribution business to improve service quality. In fact, the only incentive at the moment is for the business to reduce costs, which may be to the detriment of service quality. A service incentive scheme aims to create a situation in which revenues adjust in response to changes in service quality, and hence provide the business with an incentive to seek the efficient level of service.

An efficiency carryover mechanism aims to provide a continuous incentive for a regulated business to seek efficiencies over the whole of the regulatory period. This incentive is provided by ensuring that any efficiency gains are maintained by the business for a predetermined length of time, possibly extending over more than one regulatory period. Under the current methodology in the ACT, the regulated business may have a greater incentive to achieve efficiency gains in early years rather than later years of the regulatory period, because of the perception that the business can maintain these gains only for the remaining length of the regulatory period.

The Commission acknowledges that incentive mechanisms for either efficiency savings or service quality improvements cannot be analysed in isolation. The Commission also notes that there is a strong interrelationship between issues arising from efficiency carryover mechanisms or service incentive schemes and other aspects of utility regulation. These issues include, but are not limited to, the methodology that the regulator uses to calculate the 'X' factor in 'CPI minus X' regulation and how the regulator determines forecasts for operating and capital costs.

The Commission is mindful that the Australian Energy Regulator (AER) will assume responsibility for regulating electricity and gas distribution services nationally from 2007.² The AER released the Compendium of Electricity Transmission Regulatory Guidelines, which includes

¹ These documents can be accessed on the Commission's website: www.icrc.act.gov.au.

² The current price direction for electricity distribution services expires on 30 June 2009 and the access arrangements for natural gas distribution end in 2010.

incentive frameworks for both capital and operating expenditures, in August 2005, and the Statement of Principles for the Regulation of Transmission Revenues: Service Standard Guidelines, which includes a proposed framework for a service incentive mechanism, in November 2003. While these decisions do not commit the AER to implementing incentive mechanisms for service standards and operating and capital cost efficiencies in future reviews of distribution services, they provide a potential indication of future outcomes.

The Commission has considered all of these issues and impending new regulatory arrangements in reaching a decision on a possible efficiency carryover mechanism and service quality incentive scheme for the ACT. The Commission has also been mindful of the submissions made in response to the draft decision released in August 2005, and the practical implications of any change in regulatory methodology that might be adopted at this time.

This final decision reviews the material presented in the draft decision and the comments made on the draft decision, discusses some of the principles that provide the basis for the 'incentive' form of regulation currently used in the ACT, and reaches final conclusions and a determination on the methodology that will be used in the ACT in future.

2 Service incentive scheme

2.1 Background

In the current regulatory arrangements in the ACT, there is no explicit link between revenue and service standards. In the latest reviews of water and wastewater, electricity and gas distribution networks in the territory, the Commission determined efficient costs at a level that would allow the regulated businesses to maintain service levels at an appropriate standard. Nevertheless, the businesses still have an incentive to increase profits through reduced expenditure on ensuring adequate service standards. In response to this potential disincentive to maintain service standards, the Commission monitors the compliance of distributors against service standards that are included in the *Independent Competition and Regulatory Commission Act 1997* (ICRC Act), the *Utilities Act 2000* (Utilities Act) and various industry codes.

Service incentive schemes have been suggested, and in some jurisdictions adopted, to provide an additional incentive for the regulated business to ensure appropriate service standards by creating a link between service levels and revenues.

The Commission released a discussion paper in March 2005 as the first step in its consideration of the possible introduction of a service incentive scheme.³ The discussion paper outlined the schemes that exist in other jurisdictions and provided a description of issues related to service levels in the ACT, including a review of current service requirements and service levels; a discussion of the ‘efficient’ level of service; and a discussion of possible indicators that could be adopted to measure service, and the possible forms of service incentive scheme that could be applied.

The discussion paper identified a range of possible options for service incentive schemes. These included retaining the status quo, revising the current regulatory arrangements to increase the focus on service standards, or adopting some form of service incentive scheme. The Commission sought comments from interested parties on whether some form of service incentive scheme was required in the ACT.

In response to the discussion paper, ACTEW and ActewAGL submitted that, in preparing for the latest reviews for electricity distribution, water and wastewater services and gas access arrangements, a review of customer satisfaction and willingness to pay for existing and proposed service standards had been undertaken.⁴ ACTEW and ActewAGL noted that the study revealed overall high levels of satisfaction, a matter that was duly considered by the Commission when it made its price determinations for the current regulatory periods.

ACTEW and ActewAGL argued that, in addition to the monitoring of service standards by the Commission under the provisions of the ICRC Act, the Utilities Act and various industry codes,

³ Independent Competition and Regulatory Commission, *Discussion paper: Incentive mechanisms*, Report 3 of 2005, March 2005.

⁴ ACTEW and ActewAGL, *Response to ICRC discussion paper on regulatory incentive mechanisms*, May 2005 and NERA Consulting Proprietary Limited and ACNielsen, *Willingness to Pay Research Study, A report for ACTEW Corporation and ActewAGL*, August 2003.

current service standards are protected by specific service standard requirements contained in the contracts under which water and wastewater and gas are managed and operated. In addition, it was submitted that ActewAGL's electricity and gas distribution systems are the subject of significant liability exposures if systems are not maintained.

ACTEW and ActewAGL argued that the high level of customer satisfaction indicated in the willingness to pay study implies that the current service levels are appropriate and that any service standard incentives that may be adopted should focus on the maintenance of existing service levels. ACTEW and ActewAGL claimed that additional service standard incentives were not required in the current context, and therefore did not support the adoption of a service incentive scheme.

2.2 Draft decision

In the draft decision, the Commission concluded that there was no current justification for the introduction of a service incentive scheme. This conclusion was based on the Commission's assessment that there was no evidence that the current level of service was significantly different from the efficient level of service, and that therefore the costs of introducing a service incentive scheme would be likely to outweigh the benefits. In reaching this conclusion, the Commission was conscious of the current high level of satisfaction with the services received.

2.3 Submission on draft decision

In response to the draft decision, a joint submission from ACTEW and ActewAGL was lodged.⁵ The submission stated that ACTEW and ActewAGL welcomed the Commission's draft decision that a service incentive scheme was not required. ACTEW and ActewAGL noted that this was consistent with their observation that the current service levels met or exceeded the specified standards and that no case had been presented that indicated the incentives under the current arrangements needed to be adjusted. In addition, the submission argued that a service incentive scheme would be costly to establish and maintain, especially given the relatively small scale of utility service operations in the ACT.

2.4 Analysis and discussion

In reaching the conclusions in the draft decision, the Commission conducted its own analysis of the issues and considered the submission received from ACTEW and ActewAGL in order to determine whether the introduction of a service incentive scheme would be appropriate for the ACT.⁶

The Commission believes that the explicit goal of any service incentive scheme should be to achieve the efficient level of service. The Commission therefore needs to consider whether there is a need to address the current level of service provided in the ACT. In these considerations, the

⁵ ACTEW and ActewAGL, *Response to the draft report of the ICRC on regulatory incentive mechanisms*, 31 August 2005.

⁶ Independent Competition and Regulatory Commission, *Draft decision: Review of efficiency and service standard incentive mechanisms*, Report 5 of 2005, August 2005.

Commission is conscious of the results of the willingness to pay study conducted by ACTEW and ActewAGL that indicates that customers are currently satisfied with the level of service provided. In addition, the Commission notes that the current levels of service are of a high standard and in many cases exceed the minimum service standard requirements as set out in the Consumer Protection Code and other industry codes.

The Commission therefore concludes that, given the satisfaction with current levels of service and the absence of evidence that the current level of service is substantially different from the efficient level of service, it would need to be demonstrated that the benefits of introducing a service incentive scheme would outweigh the costs.

To determine whether the benefits would indeed outweigh the costs, in the draft decision the Commission conducted an analysis of the costs and benefits of introducing a service incentive scheme. In the analysis in the draft decision, the Commission noted the difficulty of measuring service standards, calibrating the level of service into a dollar measure based on customer values, and designing a scheme to reward or penalise the business. The draft decision highlighted the complexity associated with the implementation of a scheme and the distortions that might be created if the scheme were incorrectly calibrated; discussed the arrangements in place in the ACT, including the recent review of the Consumer Protection Code; and concluded that the current arrangements were adequate for maintaining the current level of service.

The draft decision concluded that there was no need to introduce a service incentive scheme in the ACT. The Commission noted that there was no evidence that the current level of service was significantly different from the efficient level of service, and that therefore it was likely that, if a service incentive scheme were introduced, the costs imposed in implementing the scheme would outweigh the benefits. The submission from ACTEW and ActewAGL concurred with this view.

2.5 Final decision

Since the release of the draft decision, the Commission has received no additional information that disputes the conclusions drawn in the draft decision. The submission received from ACTEW and ActewAGL on the draft decision supports the view taken by the Commission, which contends that no evidence exists that indicates an adjustment to the current arrangements is necessary. Furthermore, the Commission notes the comments from ACTEW and ActewAGL that argue the establishment and maintenance of a service incentive scheme may prove costly. Therefore, the Commission considers that the conclusions drawn in the draft decision remain valid.

3 Efficiency carryover mechanisms

3.1 Background

The basis of the current regulatory approach of adopting a ‘CPI minus X’ adjustment is that it provides the regulated business with the proper incentive to produce efficiently. The incentive to produce efficiently is achieved by setting prices for several (usually five) years and allowing the regulated business to keep any efficiency gains achieved during this period. This regulatory regime was adopted in response to the perceived shortcomings of ‘rate-of-return’ regulation, in which efficiency gains were retained by the business for a short period only (often one year).

Under the current arrangements, it has been contended, businesses may face a reduced incentive to seek efficiencies towards the end of the regulatory period. It is argued that efficiencies gained in the last year of the period are kept by the business for that year only, whereas efficiency gains in the first year of a regulatory period are kept by the business for the full length of the period. Efficiency carryover mechanisms, which were suggested as a way of addressing this issue, are intended to allow the regulated business to maintain any efficiency gains for a predetermined length of time (usually the length of the regulatory period).

The Commission released a discussion paper in March 2005.⁷ The discussion paper identified the aims of efficiency carryover mechanisms and provided information on the operation of efficiency carryover mechanisms in Australian jurisdictions as well as in the United Kingdom. In addition, the discussion paper analysed issues associated with carryover mechanisms, such as:

- the interaction between the calculation of the X factor and the methodology for determining cost forecasts with carryover mechanisms
- the relationship between efficiency gains and service quality
- the measurement of efficiency gains
- the sharing of efficiency gains between the regulated business and customers
- the treatment of efficiency losses and problems with operating cost only mechanisms.

The discussion paper concluded by identifying and seeking submissions from interested parties on various options relating to efficiency carryover mechanisms, including retaining the status quo, altering the form of regulation, adopting a mechanism to apply to operating costs only or adopting a mechanism to apply to both operating and capital costs.

In response to the discussion paper, ACTEW, in respect of its water and wastewater networks, and ActewAGL, in respect of its electricity and gas distribution networks, provided the Commission with a joint submission.⁸

⁷ Independent Competition and Regulatory Commission, *Discussion paper: Incentive mechanisms*, Report 3 of 2005, March 2005.

⁸ ACTEW and ActewAGL, *Response to ICRC discussion paper on regulatory incentive mechanisms*, May 2005.

The submission supported the introduction of a rolling carryover mechanism, the key elements being that:

- the mechanism be designed to provide a 50:50 sharing of efficiency gains between consumers and business
- if the carryover mechanism results in a net negative amount for a regulatory period, the carryover amount be set to zero
- a methodology be agreed for dealing with the fact that actual final-year expenditure information is not available at the time of the setting of the next regulatory period's price path
- a clearly defined process be established by which future cost estimates are set
- retrospective adjustments be made to cost benchmarks by a particular amount per customer/connection (or unit of consumption) if the actual number of customers/connections (or consumption) differs from the forecasts
- the carryover mechanism be applied both to operating and maintenance expenditure and to capital expenditure; however, ACTEW and ActewAGL stated that they would initially consider adopting an operating and maintenance expenditure mechanism only and would assist the Commission in developing a capital expenditure scheme to apply later.

3.2 Draft decision

The Commission released its draft decision in August 2005.⁹ The draft decision assessed efficiency carryover mechanisms in general and the specific scheme proposed by ACTEW and ActewAGL against a set of criteria established by the Commission. The criteria included transparency, simplicity and unobtrusiveness, repeatability, symmetry, accuracy, being non-distortionary, equitability and economic efficiency.

Based on the Commission's analysis of efficiency carryover mechanisms, it concluded that the benefits of adopting some form of efficiency carryover mechanism were yet to be demonstrated. In addition, the Commission considered that if an efficiency carryover mechanism were to be introduced, the costs would outweigh the benefits.

In reaching this decision, the Commission noted that if efficiency gains are considered as investment decisions (as opposed to one-off instantaneous reductions in waste, as efficiency gains are characterised in the mechanisms adopted in other jurisdictions), the problem of creating a constant incentive across the regulatory period becomes irrelevant. The Commission stated that if efficiency gains are considered as investment decisions, the important issue becomes the establishment of a regulatory regime that encourages the business to seek efficiencies where the net present value of the benefits outweighs the costs. The Commission concluded that the regulatory arrangements in place should support these types of efficiency gains and that there is therefore a need for the regulator to consider investments in future efficiencies when setting cost forecasts in future regulatory periods.

Furthermore, the Commission had specific concerns about the mechanism proposed by ACTEW and ActewAGL. The Commission concluded that the introduction of a mechanism that includes a

⁹ Independent Competition and Regulatory Commission, *Draft decision: Review of efficiency and service standard incentive mechanisms*, Report 5 of 2005, August 2005.

50:50 sharing ratio of efficiency gains, a zero carryover amount if a negative carryover is calculated, and retrospective adjustments to benchmarks, would be inappropriate. The Commission stated that it believed that such a mechanism was not transparent, would increase the obtrusiveness of the regulatory regime, was inequitable, was asymmetrical, would create distortions in production processes and would not necessarily encourage efficient long-term investment. In addition, the Commission expressed concerns about ways to deal with the unavailability of final-year expenditure data.

The Commission's draft decision was to implement no form of efficiency carryover mechanism for any distribution business in the ACT at this time.

3.3 Submissions on the draft decision

The Commission received a joint submission on the draft decision from ACTEW and ActewAGL and comments from the ACT Council of Social Service (ACTCOSS).

3.3.1 ACTEW and ActewAGL submission

The submission from ACTEW and ActewAGL expressed disappointment with the Commission's draft decision to not implement any form of efficiency carryover.¹⁰ The submission argued that, if the current arrangements continued to operate without the introduction of a carryover mechanism, the businesses would continue to be exposed to the perverse incentive to postpone potential savings until the following regulatory period. ACTEW and ActewAGL in their submission argued that the Commission should adopt a set of recommended regulatory principles.¹¹ ACTEW and ActewAGL consider these principles 'the fundamental elements to guide development of an effective regulatory framework for its utility services'.¹²

ACTEW and ActewAGL's principles are:

- provide a certain and predictable mechanism for recognising and rewarding unanticipated efficiency gains
- provide assurance that the mechanism will be applied transparently at regulatory reset
- result in an equitable sharing of unanticipated efficiency gains between the businesses and utility consumers
- ensure full recognition of past achievement of unanticipated efficiency gains when setting future revenue requirements
- apply estimates of efficient costs that account for the lumpy or cyclical nature of costs, ageing of assets, changes to business scope and changes to exogenous factors
- recognise there is greater risk to the community in the medium term from a stifling of investment by way of underfunding

¹⁰ ACTEW and ActewAGL, *Response to the draft report of the ICRC on regulatory incentive mechanisms*, 31 August 2005, p. iii.

¹¹ ACTEW and ActewAGL, *Response to the draft report of the ICRC on regulatory incentive mechanisms*, 31 August 2005, p. iii.

¹² ACTEW and ActewAGL, *Response to the draft report of the ICRC on regulatory incentive mechanisms*, 31 August 2005, p. iii.

- provide the business with no less than the revenue required to efficiently operate the business (including capital costs) in any given year
- reduce regulatory risk where it is feasible to do so
- provide neutrality between capital and operating solutions
- provide neutrality between all possible timings for unanticipated efficiency gains
- add little or no extra administrative burden
- ensure a minimum of regulatory intrusiveness.

ACTEW and ActewAGL submitted that, at a minimum, the Commission should adopt their principles as a guide to future price reset determinations. However, the submission also outlined a revised efficiency carryover mechanism which it argued the Commission should adopt. The revised mechanism was based on the rolling carryover mechanisms in place in Victoria and South Australia and had the following characteristics:

- the mechanism would be applied to both capital and operating expenditure
- efficiency gains in operating expenditure would be calculated using an incremental approach against the benchmark operating expenditure
- efficiency gains in capital expenditure would be calculated against the benchmark capital expenditure in each year, regardless of the previous year's capital expenditure level
- the length of the carryover period would initially be equal to that of a regulatory period (usually five years, which would result in a utility–consumer sharing ratio of 30:70)
- the mechanism would be symmetrical, with any negative carryover amount eligible to be offset against gains made in the following regulatory period, but only if the Commission saw fit at the time of the relevant price review
- final-year operating expenditure would be assumed to be equal to expenditure in the previous year adjusted for growth in forecast expenditure between the two years **or** final-year incremental efficiency gain in operating expenditure assumed to be zero
- final-year capital expenditure would be assumed to be equal to benchmark capital expenditure for that year
- retrospective adjustments would be made for material increases in costs resulting from events included in predetermined pass-through provisions and, possibly, for differences in forecast and outturn customer numbers using predetermined 'per customer' costs.

3.3.2 ACTCOSS submission

The submission from ACTCOSS stated that it believed that there are few, if any, benefits for consumers from the introduction of carryover mechanisms.¹³ The main argument made was that the introduction of some form of mechanism would increase the opportunity for the regulated business to 'game' the regulator, and that, by moving expenditure between years, the regulated business would be able to inflate the price it received in future years.

¹³ ACT Council of Social Service, *Comment on the Independent Competition and Regulatory Commission's Discussion paper on efficiency carryover mechanism and service incentive scheme*, May 2005.

ACTCOSS cited a research paper completed on behalf of a consortium of energy advocates in Melbourne which queried how the Essential Services Commission (ESC) of Victoria would be able to ensure that consumers in that state got the benefit of increased profits derived by distribution businesses as a consequence of the efficiency carryover mechanism adopted in that state.

3.4 Analysis and discussion

The Commission has identified three issues of concern with respect to the current practice in regulatory policy dealing with efficiency carryover mechanisms. For the remainder of this section the Commission will focus on efficiency carryover mechanisms as applied to operating costs. All of these concerns apply equally to efficiency carryover mechanisms applied to capital expenditure. The Commission notes that the AER's incremental efficiency carryover applies only to operating costs and the ESC has dropped its efficiency carryover mechanism for capital expenditure in its most recent price direction.¹⁴

The Commission's concerns are:

- the measurement of efficiency gains
- the mechanics and properties of the incremental efficiency carryover mechanism currently in use
- the reliance on forecast operating expenditure and the interaction between the approach to forecasting operating expenditure and the incentive carryover mechanism.

These concerns were raised by the Commission in its discussion paper and draft decision.

3.4.1 Measurement of efficiency gains and the focus on forecasts

One issue identified in the discussion paper was the problem of how to measure or determine efficiency gains. The Commission reiterated this concern in its draft decision. It is a common misconception that a reduction in operating costs in a given year as compared to either forecast operating costs for that year or the actual operating costs in the previous year represents an economic efficiency gain. As examined in the discussion paper, an efficiency gain arises from an improvement in productivity, which is not necessarily a reduction in costs compared to previous years' results or forecasts. This is due to the fact that the level of output or input costs may have changed independent of any change in 'efficiency'. It is acknowledged that, holding all factors constant, an improvement in productivity results in lower operating costs. However, it does not follow that a reduction in operating costs automatically means there has been a productivity improvement.

In the absence of any productivity measures or detailed benchmarking analysis against comparator businesses, operating costs are the only measure a regulator has of the regulated business's performance. The problem arising for the Commission, and regulators in general, from this rather imperfect measure of economic efficiency is whether the obvious flaws of relying on operating

¹⁴ Essential Services Commission, *Electricity distribution price review 2006–10, Final decision Volume 1, Statement of purposes and reason*, October 2005, p. 418.

costs as a measure of efficiency are small compared with the gains from incentivising this measure.

In its consideration of this issue, the Commission noted the recent final decision by the ESC in relation to the Victorian electricity distribution network. The ESC faced the challenge of differentiating between actual efficiency improvements and changes in reported ‘costs’ which may or may not have been the result of efficiency improvements. This problem was particularly evident in relation to the reported costs for services provided by firms that were related to the regulated businesses. In the ACT, a similar issue arises in terms of ACTEW and ActewAGL contracting related firms to undertake many of the tasks involved in managing and operating the relevant businesses. For water and waste water, for example, ACTEW contracts essentially all day to day operating and asset management activities to ActewAGL, a related entity.

The issues raised as part of this emerging trend to use related contractors caused the ESC to develop a framework for assessing costs incurred during the previous regulatory period where a contractor has provided works or services.¹⁵ The framework is aimed at determining whether the contract price should be considered or whether there should be an investigation of the actual costs incurred by the contractor in undertaking the contracting works.

If it is determined that the works or services are provided by way of a competitive market tender, by a related or unrelated party, the contract price is adopted. However, if it is found that the works or services were provided by a related party and a competitive tender process was not conducted, an investigation of the actual cost of the works or services is undertaken.

It is important to note from this recent regulatory experience that although the ESC continued to apply a form of efficiency carryover mechanism, it recognised the potential to ‘game’ the system because of its reliance upon the difference between forecast and actual costs as a measurement of efficiency changes. As a consequence of this revised approach, the ESC excluded a significant quantum of ‘cost savings’ from inclusion in the efficiency carryover mechanism.

The following examples highlight the problems with a mechanism that relies solely upon forecasted actual cost outcomes.

Consider a simple example. Suppose a regulated business negotiated a lower price with one of its suppliers for materials or services and that this lower price as compared to the forecast cost did not involve any efficiency improvements on the part of the regulated business. While the business has reduced its costs, this is not an economic efficiency gain, as there is no improvement in productivity if there is no change in the production input mix. In fact, this is merely a transfer of surplus from the supplier to the regulated business, and it is not clear that the regulated business should be rewarded with an extended retention of the surplus beyond the duration of the contract with the supplier, as would be the case with an incentive carryover mechanism.

Extend this example to embrace changes in the nature of the delivered service by considering the purchase of insurance services. Suppose the business reduces its insurance costs by accepting higher excess for any future insurance claims. This is not an efficiency gain, in that the business’s productivity has not improved. Instead, the business is merely expecting a higher return at the cost of greater risk. The regulated business should not be rewarded in this case. Indeed, prudent

¹⁵ Essential Services Commission, *Electricity distribution price review 2006–10, Final decision Volume 1, Statement of purposes and reason*, October 2005, p. 172.

regulation might in this instance involve not allowing the pass-through of any additional costs due to the higher excess if a claim is made against the insurance policy.

Finally, extend this to the case where the business reduces the contract price for services received from a related business.¹⁶ Again there is potentially no economic efficiency gain, but an additional concern is raised. The potential for cost shifting between related businesses is a serious issue for regulators to resolve, as highlighted in the recent ESC decision on electricity distribution services. If there is no opportunity to examine the costs incurred by a contractor that is a related business, a difference between the forecast costs and the actual costs should not be considered an efficiency gain. The Commission notes that, in its 2004 review of water and wastewater pricing, the Commission investigated the efficient costs of services provided by ActewAGL, where ActewAGL was acting as a contractor to ACTEW. In effect, the Commission was adopting a similar approach to that now used by the ESC as part of the fine tuning of its efficiency carryover mechanism.

The Commission also identified in its discussion paper and draft decision that there may be a trade-off between the level of operating costs and future levels of the quality of service. A reduction in operating expenditure in the current year in the form of reduced maintenance would most likely result in an increased probability of reductions in service levels in the future. Clearly, there is no efficiency gain in this instance.

3.4.2 Properties of incremental efficiency carryover mechanisms

The approach used by the AER and the ESC as part of their efficiency carryover mechanism depends on the identification of incremental efficiency gains as measured by cost movements. This is consistent with the approach put forward by ACTEW and ActewAGL.

The AER incentive carryover mechanism is characterised by the equation:¹⁷

$$E_t = (A_{t-1} - A_t) - (F_{t-1} - F_t) \quad \text{Equation 1}$$

where:

- E_t is the efficiency benefit/loss in period t
- A_t is the actual operating cost in period t
- F_t is the forecast cost in period t.

Rearranging the equation yields a more intuitively appealing representation of the incremental efficiency gain:

$$E_t = (F_t - A_t) - (F_{t-1} - A_{t-1}) \quad \text{Equation 2}$$

¹⁶ A related business could be a wholly or partially owned subsidiary or a business that is related in some other ownership relationship, such as both businesses being subsidiaries of a third business.

¹⁷ AER, *Compendium of Electricity Transmission Regulatory Guidelines*, August 2005, p. 15.

E_t becomes the adjustment to allowed costs until year $t + 5$. This amount is added to the forecast operating costs for those upcoming years when determining the price path. Note that it is the years during the next regulatory period to which the efficiency benefit is applied. The business does not get an extra boost during the current regulatory period, as it retains these efficiencies until the beginning of the next regulatory period if the efficiency gain is permanent.

The easiest way of analysing the properties of the incremental efficiency carryover mechanism is by means of a series of examples. The Commission's discussion paper contains a thorough discussion of the mechanics of the incremental approach embodied in the above equations. These examples will be presented through a series of tables.

Table 3.1 presents a simple example. Suppose that forecast operating expenses are expected to be \$100 per year for the first regulatory period. Further suppose that actual operating costs are \$100 in each year except year 3, where operating costs equal \$102; that is, there is a transitory cost increase in year 3. This results in an incremental efficiency loss of \$2 in year 3 and a corresponding incremental efficiency gain of \$2 in year 4. The incremental efficiency gain in year 4 results from the fact that actual costs are \$102 in year 3 and \$100 in year 4 (see Equation 1). The efficiency gain in year 4 cancels out the efficiency loss from year 3 in the first three years of the second regulatory period (assuming the efficiency gains are spread over a five-year period), but in the fourth year of the second regulatory period (year 9) the incremental efficiency gain results in a \$2 retained efficiency. This is demonstrated in Table 3.1.¹⁸

Table 3.1 Transitory cost increase

| Year | Regulatory period 1 | | | | | Regulatory period 2 | | | | |
|------------------------------------|---------------------|-----|-----|-----|-----|---------------------|-----|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Forecast expenditure | 100 | 100 | 100 | 100 | 100 | | | | | |
| Actual expenditure | 100 | 100 | 102 | 100 | 100 | | | | | |
| Underspend/ (overspend) | 0 | 0 | (2) | 0 | 0 | | | | | |
| Incremental efficiency gain/(loss) | 0 | 0 | (2) | 2 | 0 | | | | | |
| Total | | | | | (2) | | | | | |
| Underspend/ (overspend) | | | | | | | | | | |
| Efficiency carryover from: | | | | | | | | | | |
| Year 1 | | | | | 0 | | | | | |
| Year 2 | | | | | 0 | 0 | | | | |
| Year 3 | | | | | (2) | (2) | (2) | | | |
| Year 4 | | | | | 2 | 2 | 2 | 2 | | |
| Year 5 | | | | | 0 | 0 | 0 | 0 | 0 | |
| Retained efficiencies | | | | | 0 | 0 | 0 | 2 | 0 | |
| Total retained efficiencies | | | | | | | | | | 2 |

One observation from the example presented in Table 3.1 is that the transitory cost increase of \$2 in year 3 is returned to the business six years later in the form of an additional \$2 of revenue.¹⁹ The

¹⁸ In this series of tables, forecasts for years 6 to 10 are deliberately left blank.

¹⁹ While it appears that the \$2 is returned in year 9 for pricing purposes the additional \$2 would be returned to the business over the entire regulatory period. If a P_0 adjustment was used when calculating the X factor the \$2 would be returned in year 6. It is incorrect to apply a present value calculation to the 'expenditure used for pricing purposes' line,

\$2 is returned to the business regardless of whether the cost increase was legitimate or was pure waste in the sense of unnecessary expenditure.

Table 3.2 shows the opposite effect. Rather than a \$2 increase in expenditure suppose that there was a \$2 reduction in actual expenditure. This follows through to a \$2 reduction in the expenditure used for pricing purposes in year 9. This is demonstrated in Table 3.2.

Table 3.2 Transitory cost decrease

| Year | Regulatory period 1 | | | | | Regulatory period 2 | | | | |
|------------------------------------|---------------------|-----|-----|-----|----------|---------------------|-----|-----|-----|------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Forecast expenditure | 100 | 100 | 100 | 100 | 100 | | | | | |
| Actual expenditure | 100 | 100 | 98 | 100 | 100 | | | | | |
| Underspend/ (overspend) | 0 | 0 | 2 | 0 | 0 | | | | | |
| Incremental efficiency gain/(loss) | 0 | 0 | 2 | (2) | 0 | | | | | |
| Total | | | | | 2 | | | | | |
| Underspend/ (overspend) | | | | | | | | | | |
| Efficiency carryover from: | | | | | | | | | | |
| Year 1 | | | | | | 0 | | | | |
| Year 2 | | | | | | 0 | 0 | | | |
| Year 3 | | | | | | 2 | 2 | 2 | | |
| Year 4 | | | | | | (2) | (2) | (2) | (2) | |
| Year 5 | | | | | | 0 | 0 | 0 | 0 | 0 |
| Retained efficiencies | | | | | | 0 | 0 | 0 | (2) | 0 |
| Total retained efficiencies | | | | | | | | | | (2) |

Tables 3.1 and 3.2 confirm a general property of the incremental approach used in efficiency carryover mechanisms as adopted by other regulators. This property is that any underspends (overspends) are taken away (returned) in the subsequent regulatory period if the final-year actual cost is equal to the forecast cost for that year.

This result does not depend on constant forecast costs. Table 3.3 extends this analysis by allowing for costs to vary over time. In this example, forecast expenditure is expected to rise in every year. Actual expenditure rises to meet forecast expenditure in year 5, but there is an underspend of \$1 for years 2, 3 and 4. This underspend is taken away from the business in years 8, 9, and 10.

as any cost variations are smoothed over the entire regulatory period. For the purposes of this example and the following examples, all of the numbers in the tables should be thought of as real dollars not nominal dollars.

Table 3.3 Cost savings with varying costs overtime

| Year | Regulatory period 1 | | | | | Regulatory period 2 | | | | |
|------------------------------------|---------------------|-----|-----|-----|----------|---------------------|-----|-----|-----|------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Forecast expenditure | 100 | 102 | 104 | 106 | 108 | | | | | |
| Actual expenditure | 100 | 101 | 103 | 105 | 108 | | | | | |
| Underspend/ (overspend) | 0 | 1 | 1 | 1 | 0 | | | | | |
| Incremental efficiency gain/(loss) | 0 | 1 | 0 | 0 | (1) | | | | | |
| Total | | | | | 3 | | | | | |
| Underspend/ (overspend) | | | | | | | | | | |
| Efficiency carryover from: | | | | | | | | | | |
| Year 1 | | | | | 0 | | | | | |
| Year 2 | | | | | 1 | 1 | | | | |
| Year 3 | | | | | 0 | 0 | 0 | | | |
| Year 4 | | | | | 0 | 0 | 0 | 0 | | |
| Year 5 | | | | | (1) | (1) | (1) | (1) | (1) | |
| Retained efficiencies | | | | | 0 | 0 | (1) | (1) | (1) | |
| Total retained efficiencies | | | | | | | | | | (3) |

There are several conclusions that follow from these three examples. One consequence of an incremental efficiency carryover mechanism of the type favoured by some regulators in Australia is that there are reduced incentives for the business to seek transitory reductions in operating costs. In Section 3.4.1 it was argued that these may not be economic efficiency gains and hence the business should not be rewarded for achieving cost reduction in this manner. However, where they are legitimate efficiency gains, the incremental efficiency carryover mechanism reduces the incentive for the business to pursue such gains resulting in underspends compared to the forecast if those underspends are transitory. This is because, as demonstrated by the examples above, the business has those cost underspends taken away in the following regulatory period.

3.4.3 Importance of forecasts

One implication of the results set out above is that if the regulator gets the last year's forecast 'correct' in the sense that the forecast equals the actual operating cost for that year, the carryover gains (or losses) equal the total underspend (or overspend). In fact, it is only in those circumstances where the actual operating costs for the last year do not equal the forecast operating cost for that year that there is a carryover gain (or loss) that is not just a net reversal of the underspend (or overspend). This means that the most important year to project with respect to the forecast operating cost is the last year of the regulatory period. Generally, in economic forecasting the bounds on the errors of the forecasts expand the farther into the future the forecast is made. Thus the least 'reliable' year in terms of the forecasts that the regulator makes (or accepts) becomes the one year where the regulated entity knows that there are real gains to be made. The incentive to game the regulation in terms of the early-year forecasts therefore becomes very strong.

The last example, presented in Table 3.4, demonstrates what happens when actual expenditure is less than forecast expenditure in the final year. This generates a positive carryover which is retained by the regulated business. Suppose, as in the previous example, that expenditure is forecast to rise steadily over the regulatory period. The difference between this example and the previous example is that actual costs do not rise to meet the forecasts. As can be seen in Table 3.4 this generates a total underspend of \$10 and total retained efficiencies of \$14.

Table 3.4 Cost savings through year 5

| Year | Regulatory period 1 | | | | | Regulatory period 2 | | | | |
|------------------------------------|---------------------|-----|-----|-----|-----------|---------------------|---|---|---|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Forecast expenditure | 100 | 102 | 104 | 106 | 108 | | | | | |
| Actual expenditure | 100 | 101 | 102 | 103 | 104 | | | | | |
| Underspend/ (overspend) | 0 | 1 | 2 | 3 | 4 | | | | | |
| Incremental efficiency gain/(loss) | 0 | 1 | 1 | 1 | 1 | | | | | |
| Total | | | | | 10 | | | | | |
| Underspend/ (overspend) | | | | | | | | | | |
| Efficiency carryover from: | | | | | | | | | | |
| Year 1 | | | | | | 0 | | | | |
| Year 2 | | | | | | 1 | 1 | | | |
| Year 3 | | | | | | 1 | 1 | 1 | | |
| Year 4 | | | | | | 1 | 1 | 1 | 1 | |
| Year 5 | | | | | | 1 | 1 | 1 | 1 | 1 |
| Retained efficiencies | | | | | | 4 | 4 | 3 | 2 | 1 |
| Total retained efficiencies | | | | | | | | | | 14 |

This example demonstrates exactly what proponents of the incremental efficiency carryover mechanism say that the mechanism is designed to promote. That is, it provides the business with the incentive to lower its costs, notwithstanding the fact that this cost reduction (as compared to the forecast) may not actually represent a true improvement in economic efficiency. Alternatively, the outcome may have merely occurred because the forecast, particularly for the last year, was incorrect. Notwithstanding these problems with the way the mechanism operates, a regulator would be required to accept this outcome as an efficiency gain under the type of efficiency carryover mechanism favoured by the AER and the ESC and proposed for use in the ACT by ACTEW and ActewAGL. However, if the forecast of the operating costs for the final year had been \$104 (that is, equal to the actual costs incurred), the total underspend would have been only \$6 in this example, and the total retained efficiencies would have become -\$6 (as demonstrated in the example in Table 3.3). That is, the total retained efficiencies would have cancelled out the underspend. While it is likely that the effort to become more efficient does not depend on the forecast, the outcome and ultimately who receives the benefits depend crucially on the forecasts and, in particular, the final-year forecast.

The interaction between the forecasting of costs and the incentive effects can also be demonstrated by this example. The concern expressed by regulated businesses arises from the possibility that the regulator could take away from the regulated business all of the gains achieved over the most recent regulatory period, by setting a low forecast for operating costs in the subsequent regulatory period.²⁰ For example, the regulated business may have had the expectation that, given the cost outcomes in Table 3.4, forecast operating costs would be \$105 for each of the years in the next regulatory period. The regulator, however, could extract all of the total retained efficiencies back from the business by setting operating costs forecasts equal to around \$102 per year. There becomes a problem of diminished incentives to become more efficient if the regulated business expects the regulator to take the resulting cost reductions back from the business in subsequent

²⁰ In the regulatory economics literature this is known as the ‘ratchet effect’.

regulatory periods. However, it is important to note that this problem of extracting the previous period's efficiency gains in the next regulatory period is not unique to situations where an efficiency carryover mechanism is not in use. The regulator could have equally set the next period's forecast cost at a lower level than expected by the regulated entity and, as demonstrated in this example, dampened the intended effect of the carryover mechanism.

While highlighting the concerns of the regulated businesses, the Commission is not convinced that the mechanism proposed by ACTEW and ActewAGL necessarily resolves these problems in a manner that does not raise other unsuitable outcomes. The implication of this analysis is that the ability of the incentive carryover mechanism to encourage additional effort by the regulated business to become more productively efficient, and thus reduce costs, is contingent upon the manner in which the regulator determines forecast operating costs in the current and subsequent regulatory periods.

The final point that can be made using this example is with respect to the sharing of the benefits. Suppose the outcome that would occur if there were an efficiency carryover mechanism remains as given in Table 3.4. As shown in Table 3.4, this results in a total underspend of \$10 and a corresponding total carryover of \$14. Now suppose that there was no incremental efficiency carryover mechanism. In this case there would, of course, be no retained efficiencies, since retained efficiencies accrue from an efficiency carryover mechanism only. Without an efficiency carryover mechanism the business would still undertake some effort to reduce its costs, as the business would at least retain the benefits for the period of the initial regulatory period. An underspend of, say, \$8 is assumed for the purposes of the illustration. The outcome is that the efficiency carryover mechanism has generated only an extra \$2 of reduced operating costs beyond that which would have otherwise occurred. However, the business will receive a benefit of \$14 in the next regulatory period, based upon the operation of the efficiency carryover mechanism as demonstrated in Table 3.4. Thus, for an incremental \$2 in efficiency gains, the business receives a 'benefit' from the efficiency carryover mechanism of \$14.²¹

These examples have highlighted a number of the perverse characteristics of the operation of the efficiency carryover mechanism as proposed by ACTEW and ActewAGL. The Commission is not convinced that adoption of a mechanism of this type could necessarily be structured to avoid these types of unintended outcomes and result in a net benefit to all parties.

3.5 Final decision

The Commission's analysis has focused on the option of adopting an incremental efficiency carryover mechanism similar to that adopted by the AER for transmission services and the ESC for distribution services.

The Commission's final decision is that there is currently no justification to support the introduction of an efficiency carryover mechanism in the ACT. In the Commission's draft decision the Commission identified a list of attributes that an efficiency carryover mechanism should possess. The Commission considers these attributes to be consistent with the principles proposed by ACTEW and ActewAGL, as detailed above, in that they seek to establish a clear understanding

²¹ The Commission notes that there is very little research available in the economics literature on the incentive properties of mechanisms such as the incremental efficiency carryover mechanism.

and commitment to incentive regulation with a fair sharing of efficiency gains between business and consumers.

The attributes are:

- **Transparency:** a transparent mechanism will be clearly understood by regulated businesses, regulators and external parties.
- **Simplicity and unobtrusiveness:** a simple and unobtrusive mechanism will reduce the regulatory burden on the businesses and the regulator.
- **Repeatability:** the mechanism must be well defined and applicable to future regulatory periods.
- **Symmetry:** the mechanism should be symmetrical; that is, it should contain both rewards for efficiency gains and penalties for efficiency losses.
- **Accuracy:** the mechanism must be able accurately to reward or penalise the businesses for efficiency gains or losses; the incentives that it creates must be well understood.
- **Non-distortionary:** the mechanism should not have adverse impacts on the investment decisions of the businesses.
- **Equitability:** the mechanism should provide a fair sharing of efficiency gains between regulated businesses and customers.
- **Economic efficiency:** the mechanism should encourage efficient investment and promote the use of efficient production techniques.

The Commission has come to a decision that there is no justification for an incremental efficiency carryover mechanism by observing that several of the attributes that the Commission set out in the draft decision do not appear to be satisfied under an incremental approach. Importantly, the attributes of simplicity and unobtrusiveness, accuracy, being non-distortionary, equitability, and perhaps even economic efficiency are not met. This has been demonstrated by the examples presented in this chapter.

For example, simplicity and unobtrusiveness were identified in the draft decision as being primary reasons for not adopting an efficiency carryover mechanism and, as demonstrated, the Commission still believes that this is the case. The non-distortionary test fails because the incremental efficiency carryover mechanism reduces the incentive for the business to seek transitory efficiency gains or, perhaps more worryingly, does not punish the business if there is transitory waste by the business. Accuracy fails due to the reliance on forecast costs and the fact that small changes in the forecasts can result in large changes in the outcomes. The example in Table 3.4 at the end of the previous section shows that there are also unresolved measurement issues with respect to the equitability of an incremental efficiency carryover mechanism. Finally, in the absence of clear-cut guidelines or procedures for forecasting costs, overall economic efficiency can be lost if the regulated business believes that the regulator will take back any future retained efficiencies.

The Commission has concluded that it is not necessary to have a defined scheme in the form of an efficiency carryover mechanism to induce the business to become more productively efficient. Instead, the focus may more appropriately be upon developing guidelines and procedures for forecasting costs at the time of a price reset in order to give reassurance to the regulated business that, as part of the next regulatory price path reset, it will be rewarded for achieving economic efficiencies above those expected by normal productivity gains. The Commission believes that this approach provides a better avenue for further consideration of how to ensure the incentive

properties of a ‘CPI minus X’ form of regulation are effectively achieved in the determination of price paths for regulated entities.

4 Conclusion

In the draft decision the Commission stated:

The Commission believes that there are genuine benefits in creating a transparent, simple and equitable regulatory regime. Such a regime will minimise the regulatory burden both for regulated businesses and for regulatory bodies.²²

A transparent, simple, and equitable regulatory regime should provide the regulated business with the incentive to:

- make efficient investment decisions
- improve its productive efficiency
- maintain the appropriate level of service
- choose the efficient balance of operating and capital expenditure.

These attributes are broadly consistent with the principles that ACTEW and ActewAGL enunciated in their response to the Commission's draft report.

This final decision reaffirms the draft decision that neither a service incentive scheme nor an efficiency carryover mechanism is necessary at this time in the ACT. The Commission has come to this conclusion based on the submissions it has received and its analysis of the relevant mechanisms.

Responsibility for the regulation of the electricity and gas distribution services will move to the national regulator, the AER, in January 2007. The current price directions for electricity and gas expire in 2009 and 2010, respectively, and the next reviews will be completed by the AER. Further consideration of efficiency carryover mechanisms and service incentive schemes will be made for these services in the context of the AER setting the next regulatory price path.

However, the Commission will retain responsibility for the water and wastewater businesses operated by ACTEW.

The fact that the Commission has decided to not adopt explicit service incentive schemes or efficiency carryovers does not imply the Commission is unconcerned with these matters. On the contrary, the Commission continues to examine its regulatory regime to ensure that it is providing the regulated business with the incentive to improve productivity and achieve demanded service objectives. As a consequence, the Commission is planning a review of its approach to forecasting operating and capital costs for the water and wastewater businesses. This review will commence with a discussion paper, to be released in the second half of 2006, followed by a final decision in early 2007. The outcome of this review is expected to be a clear statement of the way in which the Commission will assess and determine forward projections of these costs prior to the 2008–09 price reset for water and wastewater services. This process will provide clear guidance to ACTEW in the management and operation of its water and wastewater activities.

²² Independent Competition and Regulatory Commission, *Draft decision: Review of efficiency and service standard incentive mechanisms*, Report 5 of 2005, August 2005, p. 19.

Glossary and abbreviations

| | |
|-----------------|---|
| ACCC | Australian Competition and Consumer Commission |
| ACTCOSS | ACT Council of Social Service |
| ACTEW | ACTEW Corporation Limited |
| ActewAGL | ActewAGL Distribution |
| AER | Australian Energy Regulator |
| Commission, the | Independent Competition and Regulatory Commission |
| ESC | Essential Services Commission, Victoria |
| ICRC Act | <i>Independent Competition and Regulatory Commission Act 1997</i> |
| Utilities Act | <i>Utilities Act 2000</i> |