

DISCUSSION PAPER

**PREPARED FOR THE
ECONOMIC REGULATION AUTHORITY
OF WESTERN AUSTRALIA**

***“INCENTIVE MECHANISMS FOR CODE
REGULATED GAS PIPELINE SYSTEMS”***

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SUMMARY

Incentive Mechanisms under the National Third Party Access Code for Natural Gas Pipeline Systems (the Code) are sought to foster outcomes on efficiency and growth of the gas market. Those outcomes should ideally emulate outcomes that could be expected if a competitive environment existed for the delivery of Services, including Reference Services, supplied by Covered Pipelines.

An appropriately designed Incentive Mechanism should over time help to reveal efficient costs of delivering the Reference Services and so avoid intrusive and costly regulatory activity.

Under the Code, design of an optimal Incentive Mechanism for a Covered Pipeline remains somewhat subjective. This discussion paper explores fundamental aspects of that design, raises issues and makes suggestions that may assist interested parties in their consideration of proposed Incentive Mechanisms.

Criteria for the design of Incentive Mechanisms are given in section 8.44 and section 8.46 of the Code as a series of objectives against which it is necessary to assess compliance. No absolute level of achievement of these objectives is prescribed. In addition, a number of desirable design criteria can be proposed.

Considerable flexibility is typically given to the Service Provider as to how it will conduct its business in response to the Incentive Mechanism and thus matters such as the safeguarding of service levels may need to be addressed through other means.

A price path of Reference Tariffs forecast for each year of an Access Arrangement Period, and often expressed in terms of a CPI-X formula, has become the most commonly used Incentive Mechanism for gas pipeline access regulation within Australia.

A price path set for a period with the assumption of certain efficiencies and/or sales increases being made for each year of that period provides a strong incentive for the Service Provider to achieve at least those or some equivalent efficiencies and/or those sales increases in each year.

An additional incentive is available under a price path through section 8.44 of the Code. An amendment adopted in mid-2001 to section 8.44(b) of the Code, offers security for the Service Provider that with agreement of the Relevant Regulator there can be some limit placed on the passing on of savings to Users through adjustment to Reference Tariffs. Under section 8.44(b) Incentive Mechanisms can be constructed to limit the extent of absorption into Reference Tariffs of the cost savings and/or sales revenue increases that overall would cause returns to the Service Provider from the sale of the Reference Service to exceed the level of returns expected for that Access Arrangement Period or during a period (commencing at the start of an Access Arrangement and including two or more Access Arrangement Periods).

The Code does not exclude consideration within a price path Incentive Mechanism of additional returns attributable to such things as fortuitous events or general economy-wide movements in input costs, or to economies effected in capital spending (reflected in lower interest payments and other charges).

A price path Incentive Mechanism complying with section 8.44 of the Code may be viewed by a Service Provider as inherently asymmetric in terms of the risk to its return. This is so where the Reference Tariffs reflect an overly-optimistic view of the efficiency initiatives and market growth prospects likely to be available to the Service Provider over the Access Arrangement Period.

As a practical consideration, there exists an offsetting asymmetry of information available to the Service Provider as compared to that available to the Regulator at the time the Reference Tariffs are approved. This makes it unlikely that the processes under the Code for proposing and assessing compliance of Reference Tariffs will necessarily embrace an overly-optimistic view of the availability of efficiency initiatives and market growth prospects.

A price path Incentive Mechanism that also allows for sharing of negative return variances or cost overruns, possibly by carry-forward to offset future positive variances, may be assessed as reasonable in taking the mechanism towards a position of greater symmetry of risk between the Service Provider and Users.

The individual circumstances of a Covered Pipeline may need to be considered when assessing a price path Incentive Mechanism that requires the Service Provider to also share additional returns from “blue sky” events and so potentially produces a significant “asymmetric truncation” of returns.

Unearned variances in return that result from exogenous (external) events should be included along with earned variances in return that result from endogenous (internal) management actions since:

- exogenous events need to be effectively harnessed by the Service Provider;
- the financial impact of an exogenous event may be influenced by prior commercial positioning of the Service Provider;
- some exogenous and endogenous impacts will be assumed in framing the price path for an Access Arrangement Period;
- in a competitive environment a pipeline owner would sustain for at least a period the impacts of both endogenous and exogenous events; and
- making a distinction would invite an intrusive and likely costly case-by-case assessment approach by the Relevant Regulator.

An exogenous event having an impact on return that is not able to be influenced by the Service Provider, for example changes to licence fees or taxes, might be more appropriately treated as a specified pass-through into Reference Tariffs.

Allowing a carry-forward of negative variances to return for offset against future positive variances will better emulate a competitive market situation and provide greater symmetry of risk for the Service Provider without necessarily contributing to short-term volatility in Reference Tariffs.

The simple price path Incentive Mechanism that requires the Service Provider to bear any variance to return that occurs during the current Access Arrangement Period makes no distinction between non capital costs and capital costs as a source of such a variance.

The simple price path Incentive Mechanism that does not provide for any carry-forward by the Service Provider of variances to return into the next or subsequent Access Arrangement Period(s) produces significantly different influences on the timing of expenditure saving initiatives related to non capital costs than for expenditure related to capital costs.

There is a sound basis for considering carry-forward of variances to return arising from non capital expenditure, for a fixed term at least as long as the term of the Access Arrangement Period. Carry-forward mitigates adverse influences that otherwise would impact on the timing of initiatives to implement efficiency savings in non capital expenditure.

There is a potential for significant counter-productive outcomes and on balance a limited benefit that might come from any carry-forward beyond the end of the Access Arrangement Period of variances to return arising from capital expenditure. These counter-productive outcomes relate to potential over-estimation of capital works budgets and avoidance or deferral of investments that have a low, but otherwise acceptable, impact on reducing net present costs for Users. These effects may apply in particular to capital works dealing with system integrity and service reliability.

The offsetting benefits of a carry-forward of variances to return arising from capital expenditure rely largely upon encouraging activities that would normally be ascribed anyway to a diligent and prudent operator. Those activities include efficiency in implementation of capital works, appropriate timing of the works, and innovation in design to minimise expenditure.

If it is found necessary to arrange for carry-forward of variances to return arising from capital expenditure, one approach could be based on section 8.22 of the Code. Section 8.22 requires that an adjustment be made in calculating the Capital Base at the commencement of a subsequent Access Arrangement Period. That adjustment is to be in accord with an approved Reference Tariff Policy or as determined by the Relevant Regulator. That adjustment is also to be designed to best meet the objectives set out in section 8.1 that include emulating a competitive market and providing an incentive to reduce costs and develop the market, i.e. an adjustment that implements an Incentive Mechanism.

An alternative approach to arranging for carry-forward of variances to return arising from capital expenditure may exist through direct adjustment of the Total Revenue calculation for a subsequent Access Arrangement Period. That adjustment would under the Code need to be in accord with an Incentive Mechanism statement set out in an approved Reference Tariff Policy. Adoption of this alternative approach has implications for the decision required under section 8.22 on adjustment of the Capital Base.

A price path Incentive Mechanism that provides in the calculation of Total Revenue for carry-forward of variances to return for the Service Provider arising from non capital expenditure is likely to be an enhancement beneficial to all stakeholders, compared to a simple price path Incentive Mechanism with no carry-forward.

Treating variances to return arising from capital expenditure similarly to variances to return arising from non capital expenditure would seem to be consistent with

achieving a least cost for the provision of Services. It is however not clear that introducing a similar carry-forward arrangement for variances arising from capital expenditure will ultimately be beneficial to all stakeholders.

A relevant consideration is the separate requirements that already apply in the case of capital expenditure under section 8.16(a) of the Code. Those requirements specifically address efficiency, prudence and the achievement of the lowest sustainable cost of providing Services for acceptance of New Facilities Investment into the Capital Base. Providing a carry-forward arrangement for variances arising from capital expenditure provides for an increased retention of those variances by the Service Provider and thus would appear to create the opportunity for an increased financial return to the Service Provider for what is already a requirement of it.

In addition, under such a carry-forward of variances arising from capital expenditure, it would be necessary to address a number of associated concerns including:

- ensuring that the value of any capital item giving rise to this variance that is included in the Capital Base is depreciated only once;
- adequately reflecting scope changes in capital works when setting an appropriate benchmark against which to determine variances related to efficiency; and
- the additional encouragement to the Service Provider when proposing an Access Arrangement to not under-estimate the forecast cost of capital projects.

In design of an optimal Incentive Mechanism for an individual Covered Pipeline, the Code affords considerable discretion as to the proportion of both benefits and detriments in returns from the price path forecast that is to be shared by the Service Provider with Users.

Simplistically, the optimum sharing proportion is a balance that emulates the dynamics and disciplines of a workably competitive market.

Retention by the Service Provider of variances to return beyond the Access Arrangement Period in which those variances originated reduces the potential for the price path Incentive Mechanism to produce counter-productive impacts towards the end of the Access Arrangement Period. Fixing the duration of that retention period to be the same as the duration of the Access Arrangement Period will assist in creating a glide path for tariffs that will have the generally beneficial impact of smoothing prices across Access Arrangement Periods.

A limited number of Access Arrangements approved prior to mid-2001 anticipated that under the price path Incentive Mechanism a carry-forward of benefits might become acceptable under the Code. This anticipation has facilitated in those cases the carry-forward of variances from the initial Access Arrangement Period.

Theoretical considerations of risk and return to the Service Provider point towards a 50 percent share in present value terms being a maximum to be retained by the Service Provider consistent with generating an optimal batch of efficiency measures.

Approaches to determining an optimal sharing proportion based on a case-by-case risk/return analysis appear prohibitively complex, intrusive and uncertain.

Subjective judgement is currently called upon to determine an appropriate sharing proportion. As a rule-of-thumb, it is proposed that for a 5-year Access Arrangement Period the norm should be a 5-year rolling retention term for both positive and negative variances to return arising from non capital costs, and an end of Access Arrangement retention term for both positive and negative variances to return arising from capital expenditure.

This proposed mechanism would make available as an incentive to the Service Provider on average and in present value terms around 35 percent of variances to return arising from non capital costs and around 19 percent of variances to return arising from capital expenditure.

A price path Incentive Mechanism scheme based on these proposed parameters appears to satisfy, or at least not be inconsistent with, all of the essential criteria set out in the Code. It also should be able to be implemented so as to substantially satisfy the suggested open-ended list of desirable criteria.

An example of this proposed price path Incentive Mechanism for a transmission pipeline is provided by the approved Access Arrangement for the Tubridgi Gas Pipelines in Western Australia.

Consideration of a more complex mechanism that also carries forward variances to return arising from capital expenditure assessed against benchmark costs, may be justified for particular Covered Pipelines. This more complex mechanism has been adopted in Victoria for its gas distribution systems.

1. Introduction

In preparation for forthcoming revision of gas pipeline access arrangements in Western Australia, the Economic Regulation Authority of WA (the Authority) seeks, through release of a discussion paper, to canvass public opinion on a range of issues relating to the appropriate design of Incentive Mechanisms under the National Third Party Access Code for Natural Gas Pipeline Systems (the Code).

This action by the Authority is consistent with section 2.1 of the Code specifying that the Relevant Regulator (in this case the Western Australian Independent Gas Pipelines Access Regulator) may at any time prepare and release for public comment discussion papers or issues papers and hold public consultations concerning any matter relevant to its functions under the Code.

The Code requires that where appropriate Incentive Mechanisms be included in the Reference Tariffs and Reference Tariff Policy of complying Access Arrangements. Inclusion of explicit Incentive Mechanisms in Access Arrangements has now become common practice in Australia.

The Code employs Incentive Mechanisms to improve efficiency and to promote efficient growth of the gas market. This resolves essentially into incentives for Service Providers to reduce costs and increase pipeline usage. Incentive Mechanisms typically provide for a sharing between Service Providers and Users of the resulting financial benefits of cost reductions. The key issues relating to their design have become what is the nature of those benefits that are to be shared and in what proportions are they to be shared.

The draft report of the Productivity Commission released for comment on 15 December 2003 makes draft recommendations for substantial amendments to the Code. Those amendments, if adopted, may allow certain Covered Pipelines to be subject to price monitoring as an alternative light-handed form of regulatory oversight. This alternative to price capping under the existing Reference Tariff regime has been suggested as suitable for situations where there are only modest imperfections in competition for supply of pipeline services.

Under such a price monitoring regime, it is clear that the existing Incentive Mechanism provisions of the Code would not be readily applicable. The draft recommendations on regulation through price monitoring suggest that in the future those Covered Pipelines subject to price monitoring will from time to time need to satisfy the Regulator through an agreed index methodology or otherwise that efficiency initiatives continue to be diligently progressed and that the imperfections in its competitive situation do not frustrate the eventual passing of those gains back to Users.

The Productivity Commission's draft recommendations would appear to preserve the applicability where appropriate of explicit Incentive Mechanisms for those Covered Pipelines that require full regulatory intervention under a Reference Tariff regime to meet the objectives of the Code.

The Authority has asked the Farrant Consultancy Pty Ltd (Consultant) to prepare this discussion paper on issues relating to the design of Incentive Mechanisms under the Code as it is presently enacted. The Authority is responsible for release of this discussion paper and its conduct of any related public consultation on the issues.

This discussion paper addresses in section 2 the rationale for providing efficiency and market growth incentives under the Code. Section 3 offers a broad set of criteria for the design of Incentive Mechanisms based on compliance with the Code and on features that are desirable to deliver an efficient and effective mechanism. Section 4 considers the alternative mechanisms and examines current practice under the Code. Section 5 discusses the price path mechanism as the most commonly used in Australia for gas pipeline access regulation.

In section 6 of this discussion paper, a range of issues are identified in formulating and assessing proposed price path Incentive Mechanisms under the Code. Sub-section 6.1 explores whether variances to return arising from various sources should be included in an Incentive Mechanism. Sub-section 6.2 addresses optimisation in the sharing of variances to return and suggests a preferred sharing arrangement.

This discussion paper thus raises issues and makes suggestions that may assist interested parties in their consideration of proposed Incentive Mechanisms and in framing submissions to the Authority on this subject. For ease of reference, conclusions in relation to each of the issues that have been identified in this discussion paper are presented numbered and in box format, at the end of the sections where they arise.

Relevant provisions of the Code with respect to Incentive Mechanisms are set out in Attachment A. For clarity, the text of this paper utilises, where appropriate, the definitions and terminology of the Code.

2. Rationale for Incentive Mechanisms

Service Providers and the owners of the pipeline assets that they represent are understood to be seeking to maximize the profit they derive from participation in that venture. Incentive Mechanisms are proposed in a regulatory context to align that profit objective as far as practicable with achievement of economically efficient outcomes.

For those outcomes to be reflected into improved economic efficiency in the wider economy, the financial benefits of productivity gains and cost reductions by the Service Provider must ultimately flow through to Users. Incentive Mechanisms thus need to offer a potential for increased profit in return for an ultimate sharing of benefits with Users. An ideal Incentive Mechanism should thus lead in the long term to an unambiguous win-win situation for Service Providers and Users.

A first and obvious rationale for providing some financial incentive to a regulated Service Provider to improve the efficiency and utilization of its Covered Pipeline and to share the benefits with Users can be drawn from a notional comparison with a pipeline that is operating in a workably competitive environment.

In a competitive environment, market forces are relied upon not only to keep charges to users at a reasonable level in relation to costs, but also to drive efforts by each pipeline owner to sustain market share and profitability by introducing operating and administrative efficiencies, and investing in innovation and expansion of services.

The price of failure to succeed in these things in a competitive market can be seen in erosion of long term profitability and, potentially, in financial collapse. The financial benefits to the pipeline owner of its success in these efforts must, however, be expected to be eroded over time as competitors respond similarly and the market acts to pass the boost in financial benefits on to users.

A Covered Pipeline must on the other hand be regarded as operating in an inherently non-competitive natural monopoly environment. One of the four essential criteria given in section 1.9 of the Code for there to be a recommendation for coverage by the Code is that it would be uneconomic for anyone to develop another pipeline to provide the Services provided by means of the Pipeline. Determinations on coverage are expected to also take into account any other circumstances such as competition for gas sales against other fuels at the points of consumption of the gas, that might ameliorate the substantial monopoly pricing power that otherwise would result from such a natural monopoly.

For a Covered Pipeline that lacks competitive pressure on its market share and pricing, a regulatory scheme that through a Reference Tariff addresses fair and reasonable returns to the Service Provider for no more than its routine and prudent performance will lead to concerns that the further benefits for all that are apparent in the competitive situation will not be delivered and that the Service Provider will not necessarily strive to achieve world's best practice.

A further and compelling rationale in support of Incentive Mechanisms in this Code arises simply from consideration of the practicalities of implementing a regulatory

price-cap process that does not have a mechanism such as this to over time help reveal efficient costs.

Without an effective Incentive Mechanism targeting efficiency improvements, the task of the Relevant Regulator in assessing proposed Access Arrangements and revisions would necessarily become more intrusive and more costly to conduct. The Relevant Regulator would have to strive for a detailed understanding of the cost structure of the regulated business and the commercial initiatives available to that business over a period of years in order to estimate an efficient cost base against which Reference Tariffs could be set for the next Access Arrangement Period. The outcomes could potentially be more liable to regulatory error as in this task the Relevant Regulator inevitably remains in a position of adverse information asymmetry with the Service Provider.

In short, effective Incentive Mechanisms over time reveal efficient costs, redress information asymmetry, reduce the prospect of significant regulatory error and help contain regulatory costs.

CONCLUSION 2.1

Incentive Mechanisms are sought to foster outcomes on efficiency and growth of the gas market that emulate outcomes that could be expected if a competitive environment existed for the delivery of Services, including Reference Services.

CONCLUSION 2.2

Incentive Mechanisms are also sought to over time help reveal efficient costs of delivering the Reference Services and so avoid intrusive and costly regulatory activity that would otherwise be necessary in assessing proposed Access Arrangements.

3. Design Criteria

There are a substantial number of prescribed criteria presented as objectives in section 8.44 and section 8.46 of the Code (refer Attachment A). It is necessary to assess any proposed Incentive Mechanism against these objectives, even though they impose no absolute level of satisfaction as being required for individual objectives. There are also a plethora of desirable features not explicitly expressed in the Code but against which alternative mechanisms might also be assessed.

The listings presented below of criteria against which it is necessary to assess Incentive Mechanisms and of those that might be seen as desirable, have been placed in a suggested rough order of priority, although the relative importance of these features will be open to contest in many situations.

3.1 Criteria Necessary for Compliance with Code

The following essential criteria are derived from the Code and have been paraphrased below for simplicity, with the reader advised that the specific wording of the Code should be referred to for determining compliance with the legal requirements of the Code.

Incentive Mechanisms should:

- allow the Service Provider to retain a proportion of returns in excess of those expected from the sale of Reference Services
- contain an incentive to increase sales of all Services
- contain an incentive to minimize overall costs of providing the Services
- not endanger the safety and reliability of Services
- not artificially favour one type of Service over another
- encourage the offer of new Services of potential value to Users
- contain an incentive to undertake only prudent New Facility Investment
- contain an incentive to incur only prudent non-capital costs
- ensure that Users and Prospective Users gain from increased efficiency, innovation and volume of sales
- enable returns in excess of those expected to be retained by Service Provider within and possibly also beyond the Access Arrangement Period in which those benefits arose initially.

3.2 Criteria that may be Desirable

These desirable criteria for Incentive Mechanisms are proposed by the Consultant:

Effective

- results in the delivery of more economical and convenient Services
- optimal in allocating benefits over time

Transparent

- readily understood by all stakeholders (including investors in Service Provider)
- simple to calculate with publicly available information
- scheme familiar to industry and other regulators
- proposed by the Service Provider for approval of the Relevant Regulator

Unbiased

- balanced treatment of sales volume, capital expenditure and non capital cost savings efficiency initiatives

Robust

- expressed in legally well-defined terms
- minimal potential for disputes requiring court or Gas Appeal Board consideration
- persistent (not needing to be redrafted for next or subsequent periods)
- reviewable by Regulator (if necessary due to material change in circumstances)
- responsive to change in circumstances

Reliable

- predictable in outcome and process of application
- limited likelihood of unintended consequences

Timely

- timely in terms of provision of regulatory outcomes
- no discontinuities or “black holes” in the force and effect of the incentives across an Access Arrangement Period
- delivery of allocative efficiency gains for the wider community

Low maintenance

- low cost to Service Provider to obtain/maintain information
- efficient to administer
- minimal on-going regulatory oversight required

Universal

- broad spectrum impact (capital and non capital costs, etc.)
- adaptable to all conceivable circumstances (transmission and distribution)

Benign

- failure to achieve benefits not a catastrophic outcome for any stakeholder (no threat to financial viability for Service Provider adequately performing routine and prudent activities)
- safeguards confidential information
- low potential for regulatory error
- accommodating of commercial negotiations between Service Providers and Users or Prospective Users
- not prescriptive on nature, timing or extent of efficiency initiatives

Ease of implementation

- smooth transition from existing mechanism (if any)
- uses information on prior performance that is readily available and verifiable

3.3 Other Considerations

The lack of prescription in the Code as to how the Service Provider should pursue the objectives of cost savings and promoting efficient growth in the gas market gives considerable flexibility for the Service Provider to identify, assess and implement management and other initiatives in its business in a timely and commercial manner.

This lack of prescription, however, also provides little assurance to other stakeholders that in the pursuit of lower costs and increased sales, some other aspect to the level or availability of Services will not become a casualty. For example, while a reduction in connection times or improved responsiveness to customer complaints might be desirable outcomes for level of service, the provisions on Incentive Mechanisms alone would leave these aspects wholly within the discretion of the Service Provider that might or might not adopt them as a commercial strategy to secure the prescribed general objective of efficient growth in the gas market. Accordingly, service level features of this sort, and that may be considered desirable by some Users or Prospective Users, are not considered appropriate to list here as specific objectives for Incentive Mechanisms.

It is noted that other mechanisms are available either under the Code, such as the terms and conditions for supply of Reference Services, or under licensing arrangements and in some cases separately legislated standards, to deal with these service level matters more explicitly. Those other mechanisms may need to be addressed to circumscribe where appropriate the flexibility of the Service Provider to pursue cost efficiencies.

CONCLUSION 3.1

Criteria for the design of Incentive Mechanisms are given in section 8.44 and section 8.46 of the Code as a series of objectives against which it is necessary to assess compliance although no absolute level of achievement of those objectives is prescribed.

CONCLUSION 3.2

A number of desirable design criteria can be proposed to augment the list of necessary criteria prescribed in the Code.

CONCLUSION 3.3

Considerable flexibility is given to the Service Provider as to how it will conduct its business in response to the Incentive Mechanism and thus matters such as the safeguarding of service levels may need to be addressed through other means.

4. Alternative Incentive Mechanisms

There are a number of mechanisms available that can be used to pursue the objectives set out as necessary criteria in section 3 above.

All mechanisms face the same fundamental challenge: to set a baseline for outcomes that would result from routine and prudent performance and to apportion any variance in the financial results from that baseline between the Service Provider and Users.

S.8.45 of the Code (refer Attachment A) gives three generic examples of Incentive Mechanisms:

- a) Price Path,
- b) Revenue Cap, and
- c) Rebatale Service Revenue.

Revenue caps have found wide application in electricity access regulation in Australia.

Other candidates for incentive regulation of infrastructure assets have not found broad application in the current Australian utility regulation context. These other candidates include direct profit sharing, rate of return tolerance bands, yardstick or benchmark regulation and rate case price moratoria.

Attachment B identifies Incentive Mechanisms presently applying to each Covered Pipeline in Australia. In summary:

- 16 transmission systems and 12 distribution systems are listed by the Code Registrar as Covered Pipelines,
- 12 of the covered transmission systems have an approved Access Arrangement, and the remaining 4 covered transmission systems or laterals have access arrangements that are either deferred or pending,
- All 12 transmission systems with approved Access Arrangements have a price path Incentive Mechanism that allows the Service Provider to retain variances to return arising from non capital costs and capital expenditure during the current Access Arrangement Period,
- 4 of these 12 transmission systems with approved Access Arrangements have an Incentive Mechanism that allows carry-forward of retained benefits into the next or subsequent period(s), although 11 of these 12 systems received final approval of an Access Arrangement after amendment of the Code in mid-2001 to allow carry-forward,
- 4 of these 12 transmission systems are in Queensland where the State has derogated from the Code for periods ranging up to year 2023, the setting of Reference Tariffs and the Reference Tariff Policy,
- 3 of the 12 transmission systems with approved Access Arrangements provide for the Users to share Rebatale Service Revenue from sales of Rebatale Services, in each case sharing within the current period,

- All 12 of the covered distribution systems have an approved Access Arrangement with a price path Incentive Mechanism that allows the Service Provider to retain variances to return arising from non capital costs and capital expenditure during the current Access Arrangement Period, and
- 5 of these 12 distribution systems with approved Access Arrangements have an Incentive Mechanism that allows carry-forward of retained benefits into the next or subsequent period(s), although 7 of these 12 systems received final approval of an Access Arrangement after amendment of the Code in mid-2001 that allowed carry-forward.

As revealed in Attachment B, the most commonly used Incentive Mechanism for gas pipeline access regulation within the Australian context is a price path. This price path is generated as a Reference Tariff specified for each year of the Access Arrangement Period. This approach differs from Australian electricity access regulation where a revenue cap has been favoured.

The price path Incentive Mechanism as applied under the Code:

- builds upon the prescribed function of specifying Reference Tariffs, and
- has application to a wide range of savings and innovation initiatives.

This paper will now focus on the price path mechanism and examine issues that arise for it to meet objectives listed in section 3 above as necessary and desirable criteria.

5. Price Path Incentive Mechanisms

In its usual expression, the price path established for the supply of regulated Services accommodates both cost inflation and the achievement of efficiency measures that can be assumed to become available to a diligent and prudent Service Provider over that period.

This price path mechanism is often referred to as “CPI-X”, where simplistically the Consumer Price Index or “CPI” is taken to represent cost inflation and “X” represents an aggregate factor for the impact of efficiency measures on costs.

Not all price paths are established using a rigorous CPI-X formula approach. The price path may for convenience still be expressed in CPI-X terms for the few years of an Access Arrangement period. For example, a price path may still be expressed in CPI-X terms although constructed under the Code to reflect a whole-of-life tariff structure built around a net present value approach, with incentive tariffs provided to assist in recruiting Users in early years to take up under-utilized capacity.

The typical approach to formulating a price path expressed in CPI-X terms relies upon a cost-of-service business model forecast for the Reference Tariff. The base-case for this model assumes that the Service Provider performs in a diligent and prudent manner for a regulatory rate of return. It is convenient for this model to be created from a forecast, in real value terms (dollars valued at a particular date) pre-tax and for each year in the Access Arrangement Period, of the capital and non capital costs that will be incurred by this Service Provider in providing an expected volume of Reference Service.

It can be argued that a price path set for a period with the assumption of certain efficiencies and/or sales increases being expected to be made for each year of that period provides a strong incentive for the Service Provider. The price cap for that year effectively prevents recovery of additional costs or revenue from sales foregone in that year. The Service Provider is thus motivated to achieve at least those or some equivalent efficiencies and those sales increases that have been assumed to be achieved in each year.

Inherent in such assumptions of cost savings and/or sales increase underlying a price path is an expectation that the savings and/or additional revenue will justify the effort in resources and risk involved for the Service Provider to actually achieve these particular outcomes. As the savings and/or additional revenue from these initiatives might be realized over many years, even up to the end of the operational life of the pipeline, that impact must be built into the forecast of costs for the current regulatory period and beyond. Those costs will include depreciation and a regulatory rate of return on capital, and provide the basis for a Total Revenue calculation used to set the Reference Tariffs for that Access Arrangement Period.

The consequence is that if a cost saving that has been forecast for, say, the first year of that period is not achieved in that year, then under a price cap regime the Service Provider will suffer costs above forecast and a reduced rate of return until the saving can be effected or until at least the end of the Access Arrangement Period if it cannot.

This means that there is a strong incentive to achieve efficiencies and/or sales increases that are forecast for the first few years of the period, and the incentive declines towards the end of the period as a scheduled regulatory reset point is approached.

An additional incentive is also available under a price path (or other permissible) approach, conceptually for efficiencies and/or sales increases that have not been included in the forecast used for determination of Reference Tariffs. The Code's Incentive Mechanisms provision section 8.44 offers security for the Service Provider that with agreement of the Relevant Regulator there can be some limit placed on absorbing into Reference Tariffs the cost savings and/or sales revenue increases that overall would cause returns to the Service Provider from the sale of the Reference Service to exceed the level of returns expected for that Access Arrangement Period or during a period (commencing at the start of an Access Arrangement and including two or more Access Arrangement Periods).

In providing for retention of additional returns in whole or in part by the Service Provider beyond the year in which the benefits initially arose, section 8.44 provides a convenient means for specifying the sharing of such benefits with Users.

Code section 8.44 highlights sources of additional returns that are attributable (at least in part) to the efforts of the Service Provider and that may result from lower non capital costs or greater sales of Services (not only Reference Services). It does not, however, exclude consideration of other sources of additional returns such as the impact of fortuitous events or general economy-wide movements in input costs, or of economies effected in capital spending (reflected in lower interest payments and other charges).

The outcome of choosing a price path mechanism combined with a retention arrangement for additional returns that complies with section 8.44(b), is that the Service Provider is exposed during the Access Arrangement Period to a downside risk to its return arising from not achieving all the cost efficient outcomes anticipated for a diligent and prudent operator and of not selling the forecast volume of Reference Services. As an offset to this downside risk to return during the Access Arrangement Period, the Service Provider has the potential through its efforts and possibly also through fortuitous circumstance, to achieve some incremental cost efficiencies and sale volumes. Through the provisions of section 8.44(b), the Service Provider may retain for some specified time beyond that period part or all of returns that are related to efficiency and that exceed the amount forecast at the time the Reference Tariffs were approved for that period.

In circumstances where the price path of Reference Tariffs reflects a generally favourable outcome of the efficiency initiatives and market growth prospects likely to be available to the Service Provider over the Access Arrangement Period, the Service Provider may view the resultant price path Incentive Mechanism as inherently asymmetric in terms of risk. It must run the risk to its return of not achieving across all aspects of its regulated activities the cost efficiency and sales volume gains forecast as for a diligent and prudent operator, and it can only offset that risk by achieving for at least some of those activities gains greater than those forecast on this same basis. As a practical consideration, however, there exists an offsetting asymmetry of information in respect of information that is available to the Service

Provider as compared to that available to the Regulator at the time the Reference Tariffs are approved. On this basis, the processes under the Code for proposing and assessing compliance of Reference Tariffs are unlikely to necessarily embrace an overly-optimistic view of the availability of efficiency initiatives and of market growth prospects. This matter does serve to highlight the importance of the process for determination of Reference Tariffs in terms of its impact on the force and effect of a price path Incentive Mechanism.

As discussed in section 2 of this paper, Incentive Mechanisms have the virtue of over time revealing efficient costs. As confidence increases in estimating efficient and deliverable costs, it may be assessed as reasonable to shift to a mechanism that also allows for sharing beyond the current Access Arrangement Period, of negative variances to return arising from cost overruns. This may be by means of these negative variances to return being carried forward to offset the impact of future positive variances to return, rather than having an immediate impact on increasing tariffs for Users. Including the sharing of negative variances to return on a similar basis to that of positive variances to return will shift the mechanism towards a position of greater symmetry of risk between Service Provider and User.

Extraordinary positive (favourable) variances to return, such as from significant and unforeseen increases in demand for Services, are widely regarded in the pipeline industry as ‘blue sky’ profit potential. The eventual passing on of these benefits to Users has attracted the term “asymmetric truncation”. The asymmetry in this case is not readily addressed since there is no reasonable prospect in most circumstances that Users could be exposed on the other hand to sharing of an equivalent dramatic and unforeseen decline in returns.

The Draft Report of the Productivity Commission, released in December 2003, carries a detailed analysis of this matter, and suggests that a Truncation Premium might be added to the regulatory rate of return to compensate Service Providers in general for such asymmetric truncation risk. This matter is expected to be addressed in further public hearings scheduled by the Productivity Commission for March/April 2004.

For the purposes of this paper, it is observed only that it would be relevant to consider the individual circumstances of a Covered Pipeline when assessing the impact of asymmetric truncation on investment incentives and what response might be assessed as reasonable and fair under the Code for the specific case at hand. For example, it may be difficult to justify that an established metropolitan gas distribution system as a Covered Pipeline would be significantly exposed to asymmetric truncation of its returns.

In conclusion, the adoption for an Access Arrangement Period of a Reference Tariff price path, whether it is expressed as CPI-X or not, creates an inherent Incentive Mechanism. Adding provisions for the Service Provider to retain for a specified time part or all of returns that exceed the expected returns from the sale of Services, including Reference Services, can reduce the degree of asymmetry of risk inherent in such a mechanism and strengthen the incentive for the Service Provider. The asymmetry of the mechanism may be further addressed by including carry-forward of negative variances to return and possibly also by addressing asymmetric truncation of “blue sky” potential returns.

This suggests that price path Incentive Mechanisms may need to vary in detail from case to case and may need to be revised for future Access Arrangement Periods in light of experience.

Issues that arise from the above discussion include:

- The base-case forecast for determination of a Reference Tariff price path must assume certain efficiency gains and sales increases to be reasonably achievable by a diligent and prudent operator.
- Should the treatment of variances to return expected when setting the Reference Tariffs make any distinction based on the source or nature of the variance, in particular:
 - earned (endogenous) and unearned (exogenous) variances ?
 - positive (benefit) and negative (detriment) variances ?
 - variances arising from operating cost and capital expenditure ?
- Optimizing the sharing of financial benefits and detriments:
 - duration of the Access Arrangement Period
 - duration of retention by the Service Provider of variances to return

A detailed analysis of the determination of Reference Tariffs under the Code is beyond the scope of this discussion paper. It should, however, be recognized that the determination does have a fundamental impact on the resulting Incentive Mechanism. This occurs also to the extent that the costs included in the calculation of the forecast Total Revenue requirement that under the Code is used to determine Reference Tariffs for a period, represent a benchmark against which actual costs may be compared subsequently to determine variances to return to the Service Provider that have occurred over the period.

In certain situations, such as for the major gas distribution systems in Victoria, it may be considered appropriate to distinguish between efficiency impacts, and impacts arising from an exogenous change in scope, by adjusting that benchmark for variances in scope. In the Victorian situation it has been accepted that such a scope variance would be a change in the number of new gas connections made in any one year to certain customer categories within the core area supplied through existing gas distribution infrastructure. The calculation of the impacts of such a scope change on the benchmark costs then becomes a matter of detailed consideration at the time of revision of the Access Arrangements for those gas distribution systems.

The other issues identified above are discussed in more detail in section 6 of this paper.

CONCLUSION 5.1

A price path of Reference Tariffs forecast for each year of an Access Arrangement Period, and often expressed in terms of a CPI-X formula, has become the most commonly used Incentive Mechanism for gas pipeline access regulation within Australia.

CONCLUSION 5.2

A price path set for a period with the assumption of certain efficiencies and/or sales increases being made for each year of that period provides a strong incentive for the Service Provider to achieve at least those or some equivalent efficiencies and/or those sales increases in each year.

CONCLUSION 5.3

An additional incentive is available under a price path through section 8.44 of the Code. That section offers security for the Service Provider that, with agreement of the Relevant Regulator, there can be some limit placed on absorbing into Reference Tariffs the benefits of efficiency improvements and of sales growth. Those benefits are then expressed as the cost savings and/or sales revenue increases that overall would cause returns to the Service Provider from the sale of the Reference Service to exceed the level of returns expected for that Access Arrangement Period or during a period (commencing at the start of an Access Arrangement and including two or more Access Arrangement Periods).

CONCLUSION 5.4

The Code does not exclude consideration within a price path Incentive Mechanism of additional returns attributable to such things as fortuitous events or general economy-wide movements in input costs, or to economies effected in capital spending (reflected in lower interest payments and other charges).

CONCLUSION 5.5

A price path Incentive Mechanism complying with section 8.44 of the Code may be viewed by a Service Provider as inherently asymmetric in terms of the risk to its return should Reference Tariffs reflect an overly-optimistic view of the efficiency initiatives and market growth prospects likely to be available to the Service Provider over the Access Arrangement Period. As a practical consideration, there exists an offsetting asymmetry of information available to the Service Provider as compared to that available to the Regulator at the time the Reference Tariffs are approved. This makes it unlikely that the processes under the Code for proposing and assessing compliance of Reference Tariffs will necessarily embrace an overly-optimistic view of efficiency initiatives and market growth prospects.

CONCLUSION 5.6

A price path Incentive Mechanism that also allows for sharing of negative return variances or cost overruns, possibly by carry forward to offset future positive variances, may be assessed as reasonable in taking the mechanism towards a position of greater symmetry of risk between the Users and the Service Provider.

CONCLUSION 5.7

The individual circumstances of a Covered Pipeline may need to be considered when assessing a price path Incentive Mechanism that requires the Service Provider to also share additional returns from “blue sky” events and so potentially produces a significant “asymmetric truncation” of returns.

6. Benefit Sharing Under a Price Path Incentive Mechanism

The key issues in framing an optimal complying price path Incentive Mechanism are whether any variance in the financial outcome from that supporting the price path forecast should be included no matter what its source and, if included, what proportion of that variance should be shared.

The simplest approach would be to include variances to return arising from all sources, whether having a positive or negative impact on the financial outcome for the pipeline, and to apply a single constant sharing proportion. The issues involved are addressed in the following sub-sections, to explore whether a more complex and discriminating approach might provide a better outcome than a price path Incentive Mechanism.

6.1 Distinctions Based on Source of the Variance

The aim of the Incentive Mechanisms is to encourage a Service Provider to pursue efficiency savings and increased utilization of pipeline capacity. This suggests that a distinction might be made between

- (a) positive or favourable variances that can ultimately reduce Reference Tariffs and that can be demonstrated to have been earned by the Service Provider taking some type of management action (an endogenous, or “earned”, source of variance); and
- (b) variances that are either positive and fortuitous (an exogenous, or “unearned”, source of variance), or negative no matter what the cause.

6.1.1 Earned (Endogenous) or Unearned (Exogenous) Sources

If no distinction is made between earned and unearned variances to return then in some circumstances it may be possible that a fortuitous positive variance will be retained in part by the Service Provider in the absence of any appropriate management action, or even in spite of management’s actions which have been misdirected or inappropriate. Such an outcome is not within the intent of any effective incentive and is the principal downside of not making any distinction on this basis.

There are a number of arguments in favour of not making any distinction. The first is the obverse of the above, recognizing that in many cases exogenous events need to be effectively harnessed and implemented by the Service Provider to achieve a maximum benefit or amelioration of a negative impact. An example would be a potentially favourable change in the foreign exchange rate where management may have deliberately either hedged foreign exchange exposure or alternatively exposed the operations to this risk through the terms of its contracts for supply of fuel and equipment or by not hedging. In short, the variance in return resulting from an apparently exogenous event may be considerably influenced by the management actions of the Service Provider, and these are some of the actions an Incentive Mechanism seeks to encourage.

A further argument for not making a distinction is that if fortuitous events are excluded, it would be counter to the principle expressed in section 8.1(b) of the Code

relating to emulation of a competitive environment. In a competitive environment a pipeline owner would sustain for at least a period the impacts of both endogenous and exogenous events, whether they are favourable or otherwise. Moreover, the sharing mechanism driven by market forces in a competitive environment is much the same whether the positive variance arises fortuitously or not.

A fortuitous exogenous event in a competitive environment may likely act on each of the competitors simultaneously and thus the pace at which that variance is passed through pricing to users may be relatively rapid. Attempting to make a distinction for the purpose of determining a lesser or greater share to be retained by the Service Provider would invite an intrusive and costly case-by-case assessment approach where great difficulty may be experienced in disentangling the precise amount of this particular financial impact on returns from a range of other impacts occurring at the same time and from diverse other sources.

The inclusion of both earned and unearned variances is thus supported by concerns for the practical difficulties in making that distinction, given the view expressed above that the financial impact of an exogenous event may often be considerably influenced by the prior commercial positioning of and the response by the Service Provider.

In circumstances where it can be established with reasonable certainty that an exogenous event is of a kind that is not able to be influenced by management's actions, for example changes to licence fees or taxes, this event might be more appropriately treated as a specified pass-through impact. Events that are reasonably foreseeable, have a potentially substantial financial impact and are not able to be influenced to any significant degree by the Service Provider, lend themselves to this pass-through treatment. These events may be the source of either a positive or negative variance with benefits or additional costs flowing on to Users without delay.

The CPI-X price path approach builds on an expectation of there being both exogenous sources of cost variance and endogenous efforts to mitigate the impact of those sources and to achieve efficiency and productivity gains. This exacerbates the practical problem posed in seeking any distinction between variances based upon their source since some exogenous and endogenous sources of variance will already be implicitly included into the CPI-X formula. It should be able to be assumed that all sources of variance that are going to impact on and be available to a diligent and prudent operator are implicitly included in a CPI-X approach. This leads to a specific exclusion approach where certain exogenous sources of actual or potential variance that can be identified as being outside the control or influence of the Service Provider, are specified for pass-through.

The above considerations support making a distinction only for exogenous events that have an impact on return that is outside the control and influence of the Service Provider and for that impact, should it occur, to be treated as a pass-through into Reference Tariffs.

CONCLUSION 6.1

Unearned variances in return that result from exogenous events should be included along with earned variances in return that result from endogenous management actions since:

- exogenous events need to be effectively harnessed by the Service Provider;
- the financial impact of an exogenous event may be influenced by prior commercial positioning of the Service Provider;
- some exogenous and endogenous impacts will be assumed in framing the price path;
- in a competitive environment a pipeline owner would sustain for at least a period the impacts of both endogenous and exogenous events; and
- making a distinction would invite an intrusive and likely costly case-by-case assessment approach by the Relevant Regulator.

CONCLUSION 6.2

An exogenous event having an impact on return that is not able to be influenced by the Service Provider, for example changes to licence fees or taxes, might be more appropriately treated as a specified pass-through into Reference Tariffs.

6.1.2 Positive and Negative Variances to Return

In this analysis, negative variances indicate adverse financial impacts on the Service Provider. In some circumstances the adverse impacts may be of such significance as to threaten the financial viability of the Service Provider and compromise its ability to adequately perform supply of the Reference Service and other services.

As the Reference Tariff under the Code is expected to provide a fair and reasonable cover of costs plus a return on capital employed by a prudent operator, any outcome that demonstrates this not to be the case would be of concern. Treating any negative variance as an increased cost to be shared ultimately with Users through an Incentive Mechanism would, however, have some detrimental impact on the primary purpose of the Incentive Mechanism as this sharing could lead to the lessening of effort by the Service Provider to avoid or contain increased costs.

The options for handling increased costs or lesser sales revenue leading to the prospect of substantial negative variances include the Service Provider requesting a reset of the Access Arrangement terms and, if identifiable as a specified pass-through event, the direct adjustment of Reference Tariffs.

There are conceivably more moderate circumstances where short-term excursions in operating costs or capacity utilization may give rise to modest negative variances to return. In those circumstances, the negative variance should not be taken as necessarily a signal of either substantial regulatory error or imminent financial collapse. In such circumstances it may be more appropriate to carry forward the

negative variance to offset against future favourable positive variances and so restore the long term financial outcome for the Service Provider without sudden or dramatic price increases or decreases for Users. It would be doubly of concern if transitory price rises for Users were to discourage Users and Prospective Users from utilization of available capacity as this could act to compound the negative impact.

The parallel with a competitive environment is again useful. Competitors can expect in the long term for prices to cover efficient costs and a reasonable return on capital, but there is no guarantee of protection against short term adverse impacts whether these are created as a result of exogenous events or endogenous lapses in diligent and prudent performance. A parallel for carry-forward of negative variances until these can be offset against positive variances exists in the provisions of taxation legislation for carry-forward of tax losses. Inefficient operators in the competitive situation do, however, still have to suffer the consequences of that performance.

Options to address potentially incapacitating negative variances exist under section 2.28 and section 8.3 of the Code. Section 2.28 provides for a Service Provider to request a revision of the Access Arrangement at any time within the Access Arrangement Period. Section 8.3 provides for the establishment of an Approved Reference Tariff Variation Method that enables adjustment of Reference Tariffs by the Service Provider (or Relevant Regulator) within the Access Arrangement Period as a consequence of the occurrence of a Specified Event or otherwise in accord with that Approved Reference Tariff Variation Method. Section 8.3 therefore provides the vehicle for specifying certain exogenous events for a direct pass-through to Users.

In view of the options available to the Service Provider under section 2.28 and section 8.3 of the Code, it may be seen as reasonable for the Service Provider to bear other negative variances to return that are not addressed through those sections, at least until they can be offset against future positive variances to return. The carry-forward of the impact on return of such other negative variances provides a sharing of those variances with Users in a manner that will not necessarily contribute to price volatility in the short term.

CONCLUSION 6.3

Allowing a carry-forward of negative variances to return for offset against future positive variances will tend to emulate a competitive market situation and provide greater symmetry of risk for the Service Provider and Users than a mechanism in which negative variances are not carried forward, without necessarily contributing to short-term volatility in Reference Tariffs.

6.1.3 Variances Arising from Non Capital Costs and from Capital Expenditure

Price path setting of Reference Tariffs for a period requires a forecast of future costs for operations and of revenue from sale of services, as well as of the costs to service the existing capital base, and the capital expenditure on enhancements and augmentation, balanced by adjustments for capital redundancy, if any, during that period.

Under a simple price path approach, any variances to return (positive or negative) arising from differences between actual and forecast expenditure (operating and capital) and between actual and forecast revenue from sales, are a direct impact on the Service Provider over that period.

It is then only at the point of determining Reference Tariffs for the next period that any distinction need be considered between variances in return arising from non capital costs and from capital expenditure prior to that next period. This matter arises as a consideration both for the determination of an appropriate cost base for Reference Tariffs in that next period and for any augmentation of the simple price path Incentive Mechanism by allowing carry-forward of variances into the next period.

6.1.3.1 Variances Arising from Capital Expenditure

Positive variances (savings) in capital expenditure during the period may derive from a number of sources. These include: a) over-estimates in forecasts for Reference Tariff purposes, b) delay in commencing capital works, c) reductions in scope of the works, and d) actual economies in conduct of the capital works.

Negative variances (additional costs) in capital expenditure may also arise from a number of causes. These include: a) unanticipated or under-estimated expenditure on new or expanded scope items responding to market growth, extension of the system to new users, replacement not repair decisions, etc., b) advancing construction of works, and c) overspending resulting from any number of causes including poor design, difficult ground conditions, inadequate project management, weather delays and industrial disruption.

Given the range of possible exogenous events and the scope for endogenous management actions to contain capital expenditure to an efficient level, at least consistent with that achieved by a prudent operator, some targeted Incentive Mechanism could be expected to lead to savings to be shared. Because there is often a trade-off between increased capital and increased operating spending, such as in the replace or repair decision for major rotating machinery like compressors, it would be preferable for the incentive to be balanced concerning savings in capital and in operating expenditure, so as not to unduly distort such decisions.

The extent and impact of the decisions referred to in this context needs to be kept in some perspective. The decisions relate only to the actions that flow as a consequence of responding to an Incentive Mechanism. In encouraging efficiency in implementation of an identified individual capital project, it is relevant to consider that as a forecast New Facilities Investment, that project must under section 8.16(a)(i) already have been assessed as likely to contribute to the achievement of the lowest sustainable cost of providing Services, i.e. to minimise the net present value of costs that flow through ultimately to Users.

The criterion of sustainability is important also since it can encompass capital projects as New Facilities Investments that cause the present value of costs to Users to rise rather than to fall. That criterion is reflected, for example, in section 8.16(a)(ii)(C) where capital expenditure that is necessary to maintain safety, integrity or Contracted Capacity of Services could be justified as a New Facilities Investment.

It should be able to be presumed that the actions of the Service Provider at all times, including in forecasting capital project expenditure for Reference Tariff purposes, comply with those of a prudent operator acting efficiently. It is therefore difficult to see that the manner of treating capital cost variances in comparison to treating operating cost variances under an Incentive Mechanism should have any impact on decisions to forecast implementation of specific capital projects for the next period.

The choices that are required between operating cost and capital expenditure in the process of forecasting capital projects should be based on minimising net present cost to Users based on only a regulatory rate of return applying to capital expenditure. Accordingly, the treatment of operating costs and capital expenditure under the Incentive Mechanism would not be expected to have an impact on foreseeable and significant replace/repair type decisions, and even for capital projects that happen to increase the net present value of costs to Users.

Nevertheless, it could be expected that some replace/repair type decisions could arise in subsequent responses by the Service Provider to an efficiency incentive on capital expenditure, although those decisions might be expected to be of a second tier in value and importance as compared to those already reflected in the forecast of capital expenditure made for purposes of determining the Reference Tariffs.

6.1.3.2 Treatment of Capital Expenditure Variances under the Code

Irrespective of the apparent commonsense of treating capital variances similarly and in an even-handed manner to operating cost variances so far as encouraging Service Providers to be efficient is concerned, the Code is not well designed for this purpose.

Section 8.46 of the Code deals with the design of Incentive Mechanisms, and section 8.46(d) does tackle both capital and non capital costs, but confines itself in respect to capital expenditure just to encouragement of the Service Provider to undertake only prudent New Facilities Investment and for such an incentive to be taken into account when determining prudence of New Facilities Investment for the purposes of section 8.16(a). This is, however, not directly targeting efficiency of implementation, appropriate timing or innovative design to minimise capital expenditure, all of which would be worthy objectives for an Incentive Mechanism and would parallel concepts of achieving savings and improvements in efficiency in respect of non capital expenditure.

The Code, as originally established under legislation at the end of 1997, did not provide explicitly for any carry-forward of variances to return arising from either operations or capital works.

Carry-forward of variances into the next period would provide the opportunity to augment the simple price path Incentive Mechanism in respect of the treatment of additional returns arising from non capital and/or capital variances. An amendment to section 8.44(b) in mid-2001 provided explicitly that consideration could be given to the carry-forward into subsequent period(s) of the additional returns resulting from, amongst other things, lower non capital costs and greater sale of services than forecast. The best that can probably be said for section 8.44(b) in respect of capital cost variances being also considered as having an impact on additional returns, is that section 8.44(b) does not specifically exclude these variances as a consideration.

The rationale for augmentation of the price path Incentive Mechanism by carry-forward covers both reducing the potential for gaming by the Service Provider and providing a means to change the proportion of benefits retained by the Service Provider. The latter issue is the subject of section 6.2 of this paper.

6.1.3.3 Gaming on Timing of Initiatives on Non Capital Costs

The potential for gaming by the Service Provider arising from the simple price path Incentive Mechanism (no carry-forward of additional returns) relates both to the state of information asymmetry involved in setting the forecasts on which to base the Reference Tariffs and to the timing of effort and expenditure by the Service Provider on instituting efficiency measures across an Access Arrangement Period.

The setting of those forecasts for determination of Reference Tariffs is outside the brief of this paper, although it has been observed in section 2 above that Incentive Mechanisms should over time assist in revealing efficient costs. The following explores the issue in relation to timing.

One inherent difference in capital expenditure as compared to operating expense is the generally greater extent of flexibility on timing of the capital expenditure. While prudent maintenance expenditure may also be subject to some deferral, the extent is generally limited by overriding considerations of reliability and safety.

Instituting initiatives that have been identified to reduce non capital costs and/or enhance sales revenue would in any normal competitive situation have a high priority, with benefits flowing in the short term straight to increased profitability. The simple price path Incentive Mechanism, however, has the potential to accentuate this priority for the Service Provider to bring forward into the early years of the Access Arrangement Period any identified initiative reflected in the forecast for the period.

This acceleration of implementation of non capital savings and revenue increases can deliver an enhanced return to the Service Provider above that provided for regulatory purposes in the determination of Reference Tariffs. Conversely, if the acceleration had been accommodated in the Reference Tariff forecasts it would have provided lower Reference Tariffs for Users over the period. Similarly, deferment of new initiatives for non capital savings from the later years of the current period into the next period creates the potential to inflate the cost base for determination of Reference Tariff for that next period and under a simple price path Incentive Mechanism, to increase the term over which the Service Provider retains the benefits of those particular deferred initiatives.

Avoidance of this potential for gaming on non capital saving and market growth initiatives is understood to have figured significantly in the decision in mid 2001 to amend section 8.44(b), with additional returns from these things being specifically identified in that amendment. This leads to the conclusion that the variance to return arising from this type of initiative should be carried forward as a benefit to the Service Provider for some fixed period.

The mechanism to calculate variances to return from this type of initiative relies under the Code on the Service Provider being able to reasonably demonstrate at the time of its submission of a proposed revision to its Access Arrangement that a variance in

costs of a certain amount actually existed for the particular year of the prior period. Consideration may then be given to reflecting this variance in costs as a carry-forward adjustment to the required Total Revenue determination for setting Reference Tariffs to apply in the next period.

The determination of the term of carry-forward of variances to return arising from non capital cost savings and sales revenue increases, which term for practical reasons related to non-intrusive regulatory practices needs to be at least the length of the Access Arrangement Period, is discussed in the next section of this paper dealing with benefit sharing.

CONCLUSION 6.4

The simple price path Incentive Mechanism that requires the Service Provider to bear any variance to return that occurs during the current Access Arrangement Period, makes no distinction between non capital costs and capital costs as a source of such a variance.

CONCLUSION 6.5

The simple price path Incentive Mechanism that does not provide for any carry-forward by the Service Provider of variances to return into the next or subsequent Access Arrangement Period(s), produces significantly different influences on the timing of expenditure saving initiatives related to non capital costs than for expenditure related to capital costs.

CONCLUSION 6.6

There is a sound basis for considering carry-forward of variances to return arising from non capital expenditure, for a fixed term at least as long as the term of the Access Arrangement Period, to mitigate adverse influences that otherwise would impact on the timing of initiatives to implement efficiency savings in non capital expenditure.

6.1.3.4 Gaming on Timing of Initiatives on Capital Expenditure

The situation on gaming on the basis of timing is somewhat different for capital expenditure under a simple price path Incentive Mechanism Projects that have a potential to generate a higher internal rate of return for the Service Provider due to retention in the short term by the Service Provider of cost savings against the forecast, will tend to be accelerated by it towards the early years of the Access Arrangement Period.

Those capital projects having a potential for a lower internal rate of return, possibly due to unforeseen costs that again under a price path approach would be retained by the Service Provider in the short term, will tend to be deferred towards the later years

of the period, but not deferred into the next period. The likely outcome is that capital projects that could significantly reduce operational costs and boost sales are brought forward, while other capital works that have little potential for operational cost savings, for example, measures that address reliability of supply and system integrity, are deferred.

Providing for a carry-forward for a fixed term of the benefits to the Service Provider arising from variances in capital expenditure cannot be expected to have a significant influence on this preferred schedule of projects since the same projects will be potentially more (or less) financially rewarding to the Service Provider (and ultimately to the Users) as with no carry-forward. A similar preferential schedule can be expected for capital projects that were not in the forecast used for purposes of determining the current Reference Tariff but are introduced during an Access Arrangement Period as additional capital projects.

Where there is a significant additional project to be conducted within the current period it may be regarded as a significant change in scope for capital expenditure. In those circumstances, the Service Provider might seek agreement in advance under section 8.21 that as a forecast New Facility Investment, the capital expended in due course for this additional project would meet the requirements of section 8.16(a).

For additional capital projects the Service Provider could seek agreement under section 8.21 that as a condition the actual capital would be escalated by the relevant regulatory rate of return for the intervening period to the next Capital Base reset, for inclusion in the Capital Base at that time. This approach would essentially remove any timing influence on the additional investment so far as the return on capital is concerned. The Service Provider might also seek agreement as a further condition that incremental operating expenses associated with the project for the intervening period are for regulatory purposes either capitalised or recouped as an offset adjustment to the Total Revenue requirement for the next period.

A further consideration in agreeing any carry-forward of a positive (favourable) variance to return arising from capital expenditure is the influence that increasing the short term return potentially available to the Service Provider might have on encouraging over-estimation by the Service Provider of capital expenditure forecasts used to set Reference Tariffs. The situation of adverse information asymmetry in respect to capital expenditure is perhaps more difficult for the Relevant Regulator and other stakeholders than for routine operating expenses. This gives rise to concern since there is inevitably some scope for judgement concerning the prudence of the design of New Facilities and elements such as an appropriate contingency provision in budgeting for capital works.

6.1.3.5 Over-estimation of Forecast Capital Expenditure

It is not obvious that in grappling with the potential for over-estimation of capital works budget forecasts, the Relevant Regulator should rely heavily, or at all, upon an Incentive Mechanism dealing with capital variances to over time readily reveal efficient capital costs.

This is so since there is likely to be a range of different types of capital works being addressed over time, new technologies with different cost parameters will continue to

evolve, and the individual circumstances of each capital works project may vary considerably for reasons such as the state of the contracting market and of the equipment supply market at the time.

The encouragement to not under-estimate capital budgets arises particularly when considering carry-forward of variances for projects that are scheduled towards the end of the Access Arrangement Period. These projects are the most vulnerable to inaccuracy in budget estimation, simply due to the length of time that must elapse before construction starts. The costs are exposed, for example, to changes in technology as well as to changes in the pricing of the equipment supply and construction industries due to activity levels and demand peaks and troughs in this sector.

Accordingly, it would be natural for the Service Provider to make significant contingency allowances as part of the budget estimate and to generally provide a robust (high) estimate for projects scheduled towards the end of the period. Extending the share of variances to return that can be retained by the Service Provider through a carry-forward of variances both increases the magnitude of a lower return for the Service Provider from making a low estimate and increases the return to the Service Provider from making a high estimate. The increased temptation for the Service Provider to not under-estimate will be exacerbated by the reduced capacity of the Relevant Regulator to challenge budget estimates for a project so far into the future.

Carry-forward of negative (unfavourable) variances to return arising from capital expenditure will inevitably expose the Service Provider to some additional risk of carrying a greater short term cash outflow for capital expenditure that exceeds the forecast, even if the whole of that capital expenditure is ultimately assessed as prudent and accepted under section 8.16(a) for inclusion in the Capital Base together with an appropriate return on it at the regulatory rate. While enabling carry-forward of such negative variances may seem on one hand to be providing a desirable increase in the level of discipline on management in respect to capital spending, it will on the other hand serve to further encourage as a protective measure the over-estimation of forecast capital expenditure.

Carry-forward of negative variances to return arising from capital expenditure will further discourage the Service Provider from proposing projects that have low internal rates of return and hence little capacity to absorb even a small over-run and stay within the section 8.16(a)(ii)(A) criteria in relation to incremental revenue exceeding the New Facilities Investment.

Carry-forward of these negative variances will also further discourage the Service Provider from proposing projects that have a significant or unusual potential for cost over-run, for example pipeline laying in rocky terrain with difficult access or imposed environmental conditions.

Ultimately, the sort of consequences discussed above can be unfavourable to both the Service Provider and the Users. This is so particularly when the sort of projects that are dropped or deferred as a consequence relate to system growth serving Prospective Users or to sustaining or improving delivery reliability.

Irrespective of the somewhat limited benefit that therefore might come on balance from requiring in a price path Incentive Mechanism the carry-forward of variances to return arising from capital expenditure, it is worthwhile to examine the capacity to implement any such a carry-forward incentive under the Code.

CONCLUSION 6.7

There is a potential for significant counter-productive outcomes and on balance a limited benefit that might come from any carry-forward beyond the end of the Access Arrangement Period of variances to return arising from capital expenditure. These counter-productive outcomes relate to potential over-estimation of capital works budgets and avoidance or deferral of investments that have a low, but otherwise acceptable, impact on reducing net present costs for Users. These effects may apply in particular to capital projects dealing with system integrity and service reliability. The offsetting benefits of a carry-forward of variances to return arising from capital expenditure rely largely upon encouraging activities that would normally be ascribed to a diligent and prudent operator. Those activities include efficiency in implementation of capital works, appropriate timing of the project, and innovation in design to minimise expenditure.

6.1.3.6 Code Provisions for Carry-Forward of Variances from Capital Expenditure

Sections 8.15 through 8.19 of the Code deal with New Facilities Investment and were drafted at a time when the Capital Base was anticipated to be adjusted only at the commencement of a next Access Arrangement Period. This adjustment is based in section 8.16(a) on recognising New Facility Investment that has actually been made in the current Access Arrangement Period (subject to that expenditure not being in excess of an amount that would be invested by a prudent Service Provider acting efficiently).

In addition, for the purposes of calculating Total Revenue for determination of the Reference Tariff for the next period, the Relevant Regulator may agree based on 8.16(b) to increase the Capital Base by the amount of the forecast New Facilities Investment to be made in the next Access Arrangement Period (but through section 8.20 to also be subject to the constraints of prudence and efficiency in section 8.16(a)(i) and effectiveness in section 8.16(a)(ii)).

Based on this approach of resetting the Capital Base at the commencement of the next Access Arrangement Period, it would appear that even if variances occur between forecast capital expenditure and actual capital expenditure within an Access Arrangement Period, then no matter what was the source of that variance, if the actual expenditure associated with that variance can be seen as complying with the section 8.16(a) prudence, efficiency and effectiveness constraints, then the actual capital expenditure should be added into the Capital Base at the commencement of the next period.

The requirements of section 8.16(a) concerning efficiency, prudence and the achievement of the lowest sustainable cost of providing Services for acceptance of a New Facilities Investment into the Capital Base, would appear to impose a standard of

performance on the Service Provider that would be the same as that which might be sought by an Incentive Mechanism. Providing a carry-forward arrangement for variances arising from capital expenditure provides for an increased retention of those variances by the Service Provider and thus would appear to create the opportunity for an increased financial return to the Service Provider for what is already a requirement on it.

At face value, reset of the Capital Base in accord with section 8.16(a) would also appear to frustrate any concept of carry-forward of a capital variance, since if the capital expenditure variance leads to non-compliance to some extent with section 8.16(a), then there is no basis for ever accepting the variance to that extent into the Capital Base. Positive (unfavourable) variances may of course have more difficulty in satisfying the constraints of section 8.16(a), while even capital associated with negative (favourable) variances would need to survive the section 8.16(a) prudence and effectiveness tests.

Section 8.22, however, provides an avenue for adjusting the Capital Base determination so as to effect a carry-forward if such an adjustment was as described in an approved Reference Tariff Policy, or determined by the Relevant Regulator to be consistent with the objectives of section 8.1. The objectives of section 8.1 are to apply to the design of Reference Tariffs and Reference Tariff Principles. Attention is drawn to:

- section 8.1(b) "reflecting the outcome of a competitive market", and
- section 8.1(f) "providing an incentive to the Service Provider to reduce costs and to develop the market for Reference and other Services"

Both these sub-sections of section 8.1 appear to relate in the context of section 8.22 to the delivery of an effective Incentive Mechanism in respect to capital expenditure. Accordingly, in calculating the Capital Base for the next period, an adjustment might be made in the amount of the actual capital expenditure from the current period that is added into the previous Capital Base so as to arrange a carry forward of a capital variance from the current period. The impact would be to adjust the Capital Base at commencement of the next period and to adjust the additions made each year of the next period for forecast New Facility Investment.

It is noted that by section 8.22 the Relevant Regulator is required, not simply has discretion, to address such an adjustment in the event of a capital variance existing in the current period. It would reduce the scope for contest of a regulatory determination in this matter if the manner of adjusting the Capital Base were to be approved as part of the Reference Tariff Policy for the Access Arrangement in question. This may be done as part of the Incentive Mechanism statement.

An alternative to adjustment of the Capital Base as discussed above may be to go directly to adjustment of the Total Revenue calculation. The direct adjustment to revenue needs, presumably, to be set out in the Incentive Mechanism statement of an approved Reference Tariff Policy.

This alternative approach to calculating the impact of carry-forward on Reference Tariffs has been taken in the approval in 2002 of the 5-year Access Arrangements applying from 1 January 2003 for the major gas distribution systems in Victoria. This

approach estimates the capital variance for regulatory purposes as the annual pre-tax carrying cost at the regulatory rate of return of the difference between the actual amount spent and the forecast amount adjusted as necessary using a benchmark. It seeks to make no distinction between variances to return arising from operations or capital expenditure.

The alternative approach taken in this instance by the Essential Services Commission of Victoria is relatively complex. Variances are to be determined against a benchmark reflecting scope changes from the forecast for the number of new connections. The carry-forward provides for a net off in any year of positive and/or negative variances to return arising from both operating and capital expenditure, but does not allow a net negative adjustment for any year. It allows for carry-forward of net negative variances to subsequent years except that discretion may be exercised by the Relevant Regulator to disallow negative variances to return from being carried forward beyond the end of an Access Arrangement Period.

Including a discretionary element in the carry-forward approach makes this variant of a price path Incentive Mechanism somewhat less certain in its application, but provides some protection against gaming in the final year of an Access Arrangement Period concerning whether to defer initiatives to save costs into the next period on the basis that a net negative variance would otherwise be automatically written off at the end of that final year.

Accounting adequately for depreciation is an additional consideration under either of the above approaches to implementing carry-forward of variances to return arising from capital expenditure. Section 8.33(d) of the Code specifies that the design of the Depreciation Schedule should provide for depreciation only once of the value of the asset or group of assets. That value is specified in section 8.33(d) to be the value first included in the Capital Base, subject to such adjustment for inflation (if any) as is appropriate.

In the case of implementing carry-forward under the section 8.22 approach described above, forecast values for capital expenditure on New Facilities Investment will need to be carried forward in the Capital Base into the next, and potentially subsequent, access arrangement period(s) until their carry-forward expires and actual qualifying capital costs can then be included in the Capital Base.

Under the alternative approach to carry-forward as described above, an approach based on carrying forward an amount equivalent to the annual pre-tax carrying cost of the difference between actual and forecast capital expenditure, the impact on the Depreciation Schedule is more straightforward. Under the alternative approach, actual capital costs for qualifying New Facilities Investment are to be reflected in the Capital Base from the commencement of the next Access Arrangement Period.

CONCLUSION 6.8

One approach to carry-forward of variances to return arising from capital expenditure is based on section 8.22 of the Code. Section 8.22 requires that an adjustment be made in calculating the Capital Base at the commencement of a subsequent Access Arrangement Period. That adjustment is to be in accord with an approved Reference Tariff Policy or as determined by the Relevant Regulator. That adjustment is also to be designed to best meet the objectives set out in section 8.1 that include emulating a competitive market and providing an incentive to reduce costs and develop the market, i.e. an adjustment that implements an Incentive Mechanism.

CONCLUSION 6.9

An alternative approach to arranging for carry-forward of variances to return arising from capital expenditure may exist through direct adjustment of the Total Revenue calculation for a subsequent Access Arrangement Period. That adjustment would need to be in accord with an Incentive Mechanism statement set out in an approved Reference Tariff Policy. Adoption of this alternative approach has implications for the decision required under section 8.22 on adjustment of the Capital Base.

CONCLUSION 6.10

A price path Incentive Mechanism that provides in the calculation of Total Revenue for carry-forward of variances to return for the Service Provider arising from non capital expenditure is likely to be an enhancement beneficial to all stakeholders, compared to a simple price path Incentive Mechanism with no carry-forward. It is less clear that introducing a carry-forward arising from capital expenditure will ultimately be beneficial to all stakeholders. A relevant consideration is section 8.16(a) of the Code which specifically addresses efficiency, prudence and the achievement of the lowest sustainable cost of providing Services for acceptance of a New Facilities Investment into the Capital Base. Providing a carry-forward arrangement for variances arising from capital expenditure creates the opportunity for an increased financial return to the Service Provider for what is already a requirement on it.

6.2 Optimising the Sharing of Financial Benefits and Detriments

The Code affords considerable discretion as to an appropriate Incentive Mechanism and little guidance is given as to the proportion of variances in return to the Service Provider that is to be shared by the Service Provider with Users. Section 8.44(b) indicates that in determining an appropriate proportion that the Relevant Regulator should consider in particular additional returns that are attributable (at least in part) to the efforts of the Service Provider.

Conceptually, sharing under the Code is to emulate the passing on of savings and of increased costs in a workably competitive market. A sharing mechanism might thus aim, as an optimum, for a similar proportion to be shared as is the experience in a competitive market.

Considerations such as emulating a competitive market experience are, however, not very useful in fixing a sharing proportion, since a wide variety of circumstances can apply and a simple formula or single number is not to be expected to capture the wide range of influences at work in various utility markets.

In such a workably competitive market, sharing of changes in input costs may provide some sharp peaks and troughs in pricing. Generally these changes would be expected to flow on promptly, even for items covered by long-term commodity contracts. Such sharing could not be expected to proceed in a rigid stage-wise fashion as is the case under the Code with the periodic reset at the start of the next Access Arrangement Period that typically has a duration of 5 years.

Because of the broad convenience and common usage of the largely non-intrusive price path mechanism for gas access regulation in Australia, the debate about optimal sharing has focussed on the period of retention of variances, in particular of beneficial variances, under this scheme.

The price path approach to the determination of Reference Tariffs can build in escalation and assumed productivity improvements over the Access Arrangement Period and so significantly reduce the potential for a substantial step-change adjustment of the Reference Tariff to be necessary at the end of a period. As discussed in the section above, under a simple price path Incentive Mechanism that does not provide for a carry-forward of variances to return, concern remains that the incentive will wane for the Service Provider to make productivity improvements as it approaches the opportunity to reset prices at the end of the period.

In 2001, the Code was amended in section 8.44(b) specifically to accommodate a continuation of retention of benefits by the Service Provider into the next or subsequent Access Arrangement Period. This amendment allows a rolling retention period for both positive and negative variances to return, with a consequent smoothing of the price path across regulatory resets.

Smoothing of Reference Tariffs across Access Arrangements is most pronounced if the rolling retention period equals the duration of the Access Arrangement Period. In that situation, a reset that takes the costs and throughput forecasts current at the time of the reset as the base for the Reference Tariff will provide an estimate for the end of that next period that corresponds to the full absorption into the Reference Tariff over the next Access Arrangement Period of variances to return that have occurred in the years of the current Access Arrangement Period. All other things being equal, the Reference Tariff will then follow a price or glide path from the level that applied at the end of the current period through to the level forecast on the basis of current best estimates for the end of the next period. This smoothing effect on prices has some obvious and desirable cash flow aspects for Users as well as for the Service Provider.

It is obvious that the longer that a Service Provider can retain a benefit, the greater is the proportion of value from the benefit that goes to it rather than to Users. A present value calculation may be used to determine what proportion is shared over time.

6.2.1 Present Value Proportions for Retention of Variances to Return

A base case is provided by examining the simple price path approach that inherently allows variances in sales revenue and costs from those assumed in framing the price path, to be retained by the Service Provider only up to the end of that Access Arrangement Period.

In this base case circumstance, there is no carry-forward of variances in return to the next Access Arrangement Period. When that Access Arrangement Period is five years, the Net Present Value (NPV) of variances that have been generated consistently across each of the five years of the Access Arrangement Period, compared to the NPV of those same variances continuing into the indefinite future, has been estimated by the Authority for a typical regulatory situation, to be on average around 19 percent. This means that for this base case the share in real terms being retained by the Service Provider for consistent effort in achievement of efficiencies better than those assumed in formulating the price path for that period would be around 19 percent. Similarly, a consistent failure to achieve the cost performance assumed in the price path would see the Service Provider bear around 19 percent of the financial impact of that failure.

The proportion in present value terms that is retained by the Service Provider ranges from around 30 percent for cost variances commenced in year 1, 25 percent in year 2, 20 percent in year 3, 13 percent in year 4, to around 7 percent for cost variances commenced in year 5 for a 5-year Access Arrangement Period.

If in this base case the Access Arrangement Period is ten years, then the share of variances to return that is retained in real terms by the Service Provider rises to around 32 percent on average for variances occurring consistently across that period.

The sharing figures presented here clearly depend on the assumptions concerning a number of variables including discount rates, etc.

The rapid decline shown in these estimates above for the share to the Service Provider of the variance to return underlies the case for carry-forward of variances for a fixed term, at least in the case of variances arising from non capital costs to avoid gaming on timing of saving initiatives, even if this is at the expense of dramatically improving the magnitude of the incentive provided to the Service Provider.

If the cost variances that are assumed to apply consistently in each year, are retained by the Service Provider on a rolling basis for the same length of time as the Access Arrangement Period, the proportion of value retained by the Service Provider rises to around 35 percent for a 5-year rolling retention, and to around 55 percent for a 10-year rolling retention.

An alternative case has been calculated where the variance in return each year represents a consistent percentage change in costs. A percentage reduction in costs each year then has a compounding impact on savings, similar to that of an annual productivity factor reduction in costs.

For this alternative case and with no carry-forward of variances to return, there would be a share in real terms for the Service Provider under a 5-year Access Arrangement Period of around 21 percent, and under a 10-year Access Arrangement Period of around 38 percent. With carry-forward for the same duration as the period, the share under the 5-year Access Arrangement Period rises to around 35 percent, and under the 10-year Access Arrangement Period rises to around 55 percent.

Figures typically quoted in the industry for these shares in present value terms are slightly lower at 30 percent for a rolling 5-year retention period and 50 percent for a rolling 10-year retention period. As noted above, the percentage estimated for an individual situation will depend on a range of financial and modelling assumptions.

6.2.2 Examples of Retention Granted in Approved Access Arrangements

Most Covered Pipelines identified in Attachment B, have had an initial or revised Access Arrangement approved with a 5-year Access Arrangement Period. Prior to mid-2001, the Code did not explicitly provide for retention of benefits beyond the end of that period, and accordingly early approvals provided for a cut-off of retention to be accompanied by a full reset of Reference Tariffs at the end of that period. The approval in July 2000 of an Access Arrangement for the Mid West and South West Gas Distribution Systems in WA (Alinta's WA gas distribution system) is an example of such a closed 5-year period for retention.

Some of the approvals granted prior to mid-2001 did, however, anticipate that some form of retention of benefits beyond the end of that period might subsequently become acceptable practice under the Code. Examples are the Victorian Regulator-General's approvals in 1998 for each of the three major Victorian gas distribution systems. In that case, the Victorian Essential Services Commission (ESC) at the end of 2002 approved revisions to those Access Arrangements providing in the Tariff Order for some form of carry-forward from the initial period of positive and negative variances to return arising from both capital and non capital costs.

To date, only two Covered Pipelines have received an extended 10-year Access Arrangement Period. The first was AGL's Central West System in New South Wales which gained approval for its gas distribution Access Arrangement in October 2000. The second was the Amadeus Basin to Darwin System which gained approval for its gas transmission Access Arrangement in March 2003. In both cases, retention of variances to return is only up to the end of the period.

In another variant, Envestra's SA Distribution System which gained approval in April 2003, has a 5-year Access Arrangement Period but with retention of variances to cut off at the end of the next 5-year period.

6.2.3 Bases for Optimisation of Proportion Shared

Arguments have been advanced for one or other of the retention schemes exemplified above as part of a price path Incentive Mechanism that is based upon concepts of fairness and effectiveness in delivering an optimal win-win outcome. As far as the Consultant is aware, no hard evidence has yet been provided for any Covered Pipeline as to the achievement of either of these desirable criteria in inspiring efforts of the Service Provider that unequivocally go beyond performance as a diligent and prudent

operator. However, the opportunity to demonstrate such outcomes continues to arise with the progression to revision of Access Arrangements for their next Access Arrangement Period.

In the absence of substantive evidence as to which scheme delivers an optimal outcome, resort has been made to theoretical considerations of risk and return. Given a portfolio of opportunities for increasing efficiency and utilisation of capacity, the Service Provider will pursue first those opportunities with the greatest return for the risk involved, up to some hurdle level reflecting the Service Provider's tolerance for risk against return. Raising the benefits sharing proportion for the Service Provider (i.e. increasing the retention period) lifts the potential return to the Service Provider and so should trigger activity by it on more of the available opportunities.

The rational ranking of opportunities by the Service Provider in terms of efficiency savings against risk also means that further increasing the share of returns to the owner will only result in relatively poor efficiency benefits for greater and greater risk. As the share for Users goes down at the same time as there is a decline in the rewards for ever increasing risk, the return to Users can be expected to decline somewhat faster than its simple share of savings would indicate. This relationship results in a concave rather than linear relationship of return against share for the Users, and it has been argued by the ESC in Victoria that in this situation a 50 percent share for Service Providers would have to be considered a maximum consistent with generating an optimal batch of efficiency measures.

Also, at some level this stretch by the Service Provider for productive efficiency opportunities that are more risky and offer lower returns, becomes counter-productive and inefficient in an overall sense as resources are being diverted to boost returns for high risk activities and away from opportunities that Users themselves might more economically exploit as a consequence of receiving lower Reference Tariffs.

Accordingly, any approach seeking a risk/return formula to adjust the sharing proportion to achieve an optimal win-win outcome would need to consider the balance between investment opportunities available to Users as well as to the Service Provider. The complexity, intrusiveness and ultimate uncertainty of this approach renders it prohibitive.

Stakeholders are thus faced for the moment with continuing to rely upon a degree of subjective assessment as to what constitutes an acceptable Incentive Mechanism and the proportion of benefits/detriments to be shared between Service Provider and Users in any particular situation.

Simplistically, the optimum sharing proportion is a balance that emulates the dynamics and disciplines of a workably competitive market. Realistically, the Service Provider has to perceive an opportunity to gain additional benefits that adequately compensate it for whatever incremental risk and resources are involved in pursuit of the sort of savings and market growth opportunities the Service Provider might embrace if it was defending its market share and profitability in a workably competitive market.

Taking this competitive market place approach as to a sufficient incentive does lead to a subjective judgement being required. This judgement is, however, not about what

might seem “fair” in terms of the Service Provider and the Users splitting up some bonus or windfall. It is noted that nowhere in the Code is “fair” sharing of efficiency benefits specified. Neither is the outcome being sought to be the result of some sort of negotiation which settles in a compromise where the parties agree to simply split the difference.

What is being sought is an outcome that reflects the dispassionate forces of competition. In this context, it would be difficult to argue that the Service Provider should retain any benefit above the regulatory rate of return for any substantial time, even if that benefit was due to some effort by the Service Provider that could be considered to have gone beyond that of a diligent and prudent operator.

For a variety of practical reasons that include containing the cost of regulation and limiting the intrusion of that regulation into the normal business functions of the Service Provider, the typical Access Arrangement Period approved under the Code is not less than 5 years.

As discussed in section 5 of this paper, the price path Reference Tariff scheme provides an Incentive Mechanism in which variances to return from all sources are retained by the Service Provider until the end of the Access Arrangement Period. For reasons related to gaming based on timing of efficiency initiatives, as discussed in sub-sections 6.1.3.3 to 6.1.3.5 of this paper, augmentation of that Incentive Mechanism to allow carry-forward of variances to return arising from non capital expenditure for at least the same term as that of the Access Arrangement Period is well supported, while carry-forward of variances to return arising from capital expenditure remains more problematic.

It is noted that under such carry-forward arrangements, the assessment of the values to be carried forward is required only at the commencement of the next Access Arrangement Period. This coincides with consideration of proposed revisions to the Access Arrangement. Hence, it is not expected that the regulatory implementation of a carry-forward scheme need impose a significant additional burden on the Service Provider in terms of information provision or regulatory cost.

6.2.4 Proposed Incentive Mechanism

The suggested outcome for a 5-year Access Arrangement Period is therefore an augmented price path Incentive Mechanism that provides for a 5-year carry-forward of variances to return arising from non capital costs (thereby delivering on average around 35 percent in real terms of those variances to the Service Provider) and that does not provide for carry-forward of variances to return arising from capital expenditure (thereby delivering on average around 19 percent in real terms of those variances to the Service Provider).

This level of proportionate sharing of positive and negative variances to return arising from both non capital and capital costs represents a practical scheme that does not appear at face value to be excessively generous to either the Service Provider or the Users. It would preferably be designed to carry-forward any net negative positions to offset future positive variances to return. In the absence of substantive evidence to demonstrate that this level of proportionate sharing does not provide a sufficient incentive to achieve the targeted economic benefits, this level of proportionate sharing

of variances to return is proposed as a workable rule-of-thumb for an acceptable Incentive Mechanism.

When assessed against the design criteria presented in section 3 of this paper, this proposed augmented price path Incentive Mechanism, when combined with other relevant provisions of the Code, would appear to satisfy, or at least not be inconsistent with, all the essential design criteria. It also should be able to be implemented so as to substantially satisfy the suggested open-ended list of desirable criteria.

The proposed augmented price path Incentive Mechanism should satisfy essential design criteria as follows:

- allow the Service Provider to retain a proportion of returns in excess of those expected from the sale of Reference Services,
- provide an incentive to increase sales of all Services,
- provide an incentive to minimize overall costs of providing the Services,
- not necessarily endanger the safety and reliability of Services,
- not artificially favour one type of Service over another,
- encourage the offer of new Services of potential value to Users,
- foster undertaking only prudent New Facility Investment,
- foster incurring only prudent non capital costs,
- ensure that Users and Prospective Users gain from increased efficiency, innovation and volume of sales, and
- allow retention of returns in excess of those expected to be retained by the Service Provider within, and for non capital costs beyond, the Access Arrangement Period in which those benefits arose initially.

An example of this proposed augmented price path Incentive Mechanism applied to a transmission system is contained in the Access Arrangement approved in October 2001 by the Relevant Regulator in Western Australia for the Tubridgi Pipeline System operated by Sagasco SE Inc.

There are currently no examples of this proposed augmented price path Incentive Mechanism in approved Access Arrangements for gas distribution systems.

It is noted that the approval by the Essential Service Commission in Victoria at the end of 2002 of revisions to Access Arrangements for the three major gas distribution systems in that state adopted a more complex scheme. In that case, a 5-year carry-forward of variances to return that arise from capital expenditure has been included with adjustments for scope changes against benchmarks for gas connection activity as a core business activity of the Service Provider.

For a major gas distribution system, connection activity is customer-driven and an essentially continuous and routine activity. As far as the Incentive Mechanism in those cases is concerned, the timing of that particular type of capital expenditure should not become an issue, reasonably reliable benchmarks for the unit cost of connections should be feasible even for as much as 5 years into the future, and gas market growth might be inhibited should the Service Provider feel exposed to increased capital expenditure being required due to the number of connections rising above forecast levels. Accordingly, in such cases the additional complexity associated with carry-forward of variances to return from this type of capital expenditure might be assessed as reasonable in relation to the additional incentive created to contain costs to Users in the longer term.

It is expected, however, that in assessing an Incentive Mechanism proposed for any Access Arrangement under this Code, stakeholders would wish to see substantiation of a reasonable basis for inclusion of any carry-forward of variances to return arising from capital expenditure.

CONCLUSION 6.11

The Code affords considerable discretion as to the proportion of both benefits and detriments in returns from the price path forecast that is to be shared by the Service Provider with Users.

CONCLUSION 6.12

Simplistically, the optimum sharing proportion is a balance that emulates the dynamics and disciplines of a workably competitive market.

CONCLUSION 6.13

Amendment in mid-2001 to section 8.44(b) of the Code provided for retention by the Service Provider of variances to return beyond the Access Arrangement Period in which those variances originated, thus reducing the potential for the price path Incentive Mechanism to produce counter-productive impacts towards the end of an Access Arrangement Period.

CONCLUSION 6.14

Fixing the duration of a retention period to be the same as the duration of the Access Arrangement Period will assist in creating a glide path for tariffs that will have the generally beneficial impact of smoothing prices across Access Arrangement Periods.

CONCLUSION 6.15

A limited number of Access Arrangements approved prior to mid-2001 anticipated that under the price path Incentive Mechanism a carry-forward of benefits might become acceptable under the Code, facilitating in those cases the carry-forward of variances from the initial Access Arrangement Period.

CONCLUSION 6.16

Theoretical considerations of risk and return to the Service Provider point towards a 50 percent share in present value terms being a maximum to be retained by the Service Provider consistent with generating an optimal batch of efficiency measures.

CONCLUSION 6.17

Approaches to determining an optimal sharing proportion based on a case-by-case risk/return analysis appear prohibitively complex, intrusive and uncertain.

CONCLUSION 6.18

Subjective judgement is currently called upon to determine an appropriate sharing proportion. As a rule-of-thumb, it is suggested that for a 5-year Access Arrangement Period the norm should be a 5-year rolling retention term for both positive and negative variances to return arising from non capital costs, and an end of Access Arrangement retention term for both positive and negative variances to return arising from capital expenditure. A price path Incentive Mechanism scheme based on these proposed parameters appears to satisfy, or at least not be inconsistent with, all of the essential criteria set out in the Code. It also should be able to be implemented so as to substantially satisfy the suggested open-ended list of desirable criteria.

ATTACHMENT A

CODE PROVISIONS IN RELATION TO INCENTIVE MECHANISMS

The Overview to section 8 of the Code dealing with Reference Tariff Principles provides interpretive guidance as follows:

“The Principles also require that, where appropriate, Reference Tariffs be designed to provide the Service Provider with the ability to earn greater profits (or less profits) than anticipated between reviews if it outperforms (or under performs against) the benchmarks that were adopted in setting the Reference Tariffs. The intention is that, to the extent possible, Service Providers be given a market-based incentive to improve efficiency and to promote efficient growth of the gas market (an Incentive Mechanism).”

Section 8.44 provides the legal definition of Incentive Mechanism. It describes a mechanism that is to be expressed within the Reference Tariff Policy and is applicable to returns that derive specifically from the sale of the Reference Service and are in excess of expectations. It provides for that excess to be apportioned in part or in whole to the Service Provider over a single Access Arrangement Period or over two or more such periods, as follows:

“The Reference Tariff policy should, wherever the Relevant Regulator considers appropriate, contain a mechanism (an Incentive Mechanism) that permits the Service Provider to retain all, or any share of, any returns to the Service Provider from the sale of the Reference Service:

- (a) during an Access Arrangement Period, that exceed the level of returns expected for that Access Arrangement Period; or
- (b) during a period (commencing at the start of an Access Arrangement and including two or more Access Arrangement Periods) approved by the Relevant Regulator, that exceed the level of returns expected for that period,

particularly where the Relevant Regulator is of the view that the additional returns are attributable (at least in part), to the efforts of the Service Provider. Such additional returns may result, amongst other things, from lower Non Capital Costs or greater sale of Services than forecast.”

Section 8.45 gives three examples in broad terms of the sort of mechanism that may be included within an Incentive Mechanism for establishing the nature of a benefit that may be shared with the Service Provider.

“An Incentive Mechanism may include (but is not limited to) the following:

- (a) specifying the Reference Tariff that will apply during each year of the Access Arrangement Period based on forecasts of all relevant variables (and which may assume that the Service Provider can achieve defined efficiency gains) regardless of the realized values for those variables;
- (b) specifying a target for revenue from sale of all Services provided by means of the Covered Pipeline, and specifying that a certain proportion of any revenue received in excess of that target shall be retained by the Service Provider and that the remainder must be used to reduce the Tariffs for all Services provided by means of the Covered Pipeline (or to provide a rebate to Users of the Covered Pipeline); and
- (c) a rebate mechanism for Rebatable Services pursuant to section 8.40 that provides for less than a full rebate of revenues from the Rebatable Services to the Users of the Reference Service.”

The first example above fixes the Reference Tariff for a period and requires the Service Provider to accept any variation (positive or negative) in the return that is generated from sale of the Reference Service over that time. While the potential that exists in this example for a negative outcome for the Service Provider is not specifically addressed in section 8.44, acceptance of that potential would be consistent with the interpretation provided in the Overview for section 8 (above) that the Service Provider be given a “market-based incentive” to improve efficiency and to promote efficient growth in the gas market. Markets are typically unforgiving in exacting a price for failure to deliver on promised efficiency measures and on sales growth from marketing initiatives.

The second example fixes a revenue target for sale of all Services (including the Reference Service) over a period and requires the Service Provider to share only a certain proportion of any positive variation in the amount of revenue from the sale of all Services. The implication is that the Service Provider bears 100 percent of any negative variation of revenue below the target.

The third example deals with a separate source of revenue deriving from sale of Rebatable Services. It simply seeks to create a financial incentive for the Service Provider to secure sales of such services by reducing the proportion of the rebate going to Users.

Section 8.46 gives five objectives for the design of an Incentive Mechanism. It does not provide any guidance as to the relative weight to be given by the Relevant Regulator to the achieving of each or any of these objectives, although the statement does not make any of them mandatory.

“An Incentive Mechanism should be designed with a view to achieving the following objectives:

- (a) to provide the Service Provider with an incentive to increase the volume of sales of all Services, but to avoid providing an artificial incentive to favour the sale of one Service over another;
- (b) to provide the Service Provider with an incentive to minimize the overall costs attributable to providing those Services, consistent with the safe and reliable provision of such Services;
- (c) to provide the Service Provider with an incentive to develop new Services in response to the needs of the market for Services;
- (d) to provide the Service Provider with an incentive to undertake only prudent New Facilities Investment and to incur only prudent Non Capital Costs, and for this incentive to be taken into account when determining the prudence of New Facilities Investment and Non Capital Costs for the purposes of sections 8.16(a) and 8.37; and
- (e) to ensure that Users and Prospective Users gain from increased efficiency, innovation and volume of sales (but not necessarily in the Access Arrangement Period during which such increased efficiency, innovation or volume of sales occur).”

Since Incentive Mechanisms, when appropriate, form an integral component of an Access Arrangement, any mechanism that would negatively impact on the overall objectives of section 8 and of the Code should not be acceptable. This integral nature

is made clear in section 8.4 when addressing the determination of Total Revenue, as follows:

“However, the methodology used to calculate the Cost of Service, an IRR or NPV may also allow the Service Provider to retain some or all of the benefits arising from efficiency gains under an Incentive Mechanism. The amount of the benefit will be determined by the Relevant Regulator in the range of between 100% and 0% of the total efficiency gains achieved.”

This integral nature is also displayed in section 8.49 when addressing the Relevant Regulator’s assessment of compliance with section 8 requirements by a proposed Reference Tariff. In doing so the Relevant Regulator is given discretion specifically to draw an inference concerning the results of an appropriate Incentive Mechanism in regards to the achievement of other requirements of the Code.

“Subject to the requirement for public consultation, the Relevant Regulator may determine its own policies for assessing whether a reference Tariff meets the requirements of this section 8. For example, the Relevant Regulator may:

- (a) draw an inference that an appropriate Incentive Mechanism will result in:
 - (i) New Facilities Investment that meets the requirements of section 8.16(a)(i) and 8.16(a)(ii)(A); and/or
 - (ii) That Non Capital Costs meet the requirements of section 8.37;
- (b)

ATTACHMENT B

INCENTIVE MECHANISMS APPROVED UNDER GAS PIPELINE ACCESS
REGULATION IN AUSTRALIA

Pipeline	Operator	Regulator	Incentive Mechanism	Parameters
Queensland Natural Gas Transmission Pipelines				
Roma to Brisbane Pipeline - Wallumbilla to Brisbane	Australian Pipeline Trust	ACCC	Tariff caps (existing tariff agreement)	Approved September 2002. Tariffs and Reference Tariff Policy derogated till 31 Jan 2006.
Sth West Qld Pipeline - Ballera to Wallumbilla	Epic Energy Pty Ltd	ACCC	Tariff caps (existing tariff agreement)	Approved June 2002. Tariffs and Reference Tariff Policy derogated till 30 Dec 2016
Queensland Gas Pipeline - Wallumbilla to Rockhampton	Duke Energy International (Alinta)	ACCC	Tariff caps (existing tariff agreement)	Approved November 2001. Tariffs and Reference Tariff Policy derogated till 31 Aug 2016.
Carpentaria Gas Pipeline - Ballera to Mount Isa	Australian Pipeline Trust (Roverton Pty Ltd (CGPJV))	ACCC	Tariff caps (existing tariff agreement)	Approved November 2001. Tariffs and Reference Tariff Policy derogated till 1 May 2023.
Queensland Natural Gas Distribution System				
Envestra Limited Gas Distribution Network - Gladstone Ipswich North Brisbane Rockhampton	Envestra Limited	QCA	Price path	Approved December 2001. 5-year access arrangement period with retention to end of period.
Allgas Energy System - Gold Coast Oakey South Brisbane Toowoomba	Allgas Energy Limited	QCA	Price path	Approved December 2001. 5-year access arrangement period with retention to end of period.

New South Wales & The Australian Capital Territory Natural Gas Transmission Pipelines				
Moomba to Sydney Pipeline System – Marsden to Wilton	Eastern Australian Pipeline Ltd (AGL Gas Networks Ltd)	ACCC	Price Path	Access arrangement drafted by ACCC December 2003 in effect 1 January 2004, remains under appeal to Australian Competition Tribunal. 5.5 year Access Arrangement Period, with retention to end of period. No rebatable services.
Wilton to Newcastle	AGL Gas Networks Limited	IPART	N/A	
Wilton to Wollongong	AGL Gas Networks Limited	IPART	N/A	
Marsden to Dubbo	Australian Pipeline Trust (AGL Pipelines (NSW) P/L)	ACCC	N/A	Approved September 2000.
New South Wales, The Australian Territory & Albury Natural Gas Distribution System				
AGL NSW Distribution	AGL Gas Networks Limited	IPART	Price path	Revision Approved September 2000. Retention till end of period (2003/2004).
AGL Central West System - Dubbo Forbes Narromine Parkes Weddin Wellington	AGL Pipelines (AGL Gas Networks Limited)	ACCC	Price path, CPI-X after 2002.	Approved October 2000. 10-year access arrangement with retention until end of period. No rebatable services.
Albury Gas Company System - Albury Hume Corowa	Albury Gas Company (Stratus/ Envestra)	ESC	Price path	Approved December 2002. 5-year access arrangement period with retention of net capital and operating cost variances on a rolling 5-year term.
Great Southern Energy System - Wagga Wagga	Great Southern Energy (Country Energy Gas Pty Ltd)	IPART	Price path	Approved September 1999 by Australian Competition Tribunal. Revision by 1 Jan 2005.
Canberra Gas Distribution System - Canberra Queanbeyan Yarrowlumlula	ActewAGL Distribution (AGL Gas Company ACT Ltd.)	ICRC	Price path	Approved June 2001.

Victoria Natural Gas Transmission Pipelines				
Principal Transmission System	Vic. Energy Networks Corp. (VENCorp)	ACCC	Price path, CPI-X.	Approved December 1998, Revision approved December 2003 as an appeal determination by Australian Competition Tribunal. 5-year access arrangement period with retention of benefits to be shared in subsequent access arrangement period(s) in accord with Tariff Order.
Western Transmission System	GasNet Australian (Operations) Pty Ltd	ACCC	Price path, CPI-X.	Approved December 1998 (now treated as part of Principal system for access arrangements).
Victoria Natural Gas Distribution System				
Stratus Distribution Systems - Mornington Peninsula	Envestra Limited – (Origin Asset Management)	ESC	Price path	Approved December 1998. Revision approved November 2002 for a 5-year access arrangement period with retention of net capital and operating cost variances on a rolling 5-year term.
Multinet Gas Systems - Eastern Metropolitan	United Energy (Multinet Gas)	ESC	Price path	Approved December 1998. Revision approved November 2002 for a 5-year access arrangement period with retention of net capital and operating cost variances on a rolling 5-year term.
Weststar Energy Systems - Western Metropolitan	TXU Ltd	ESC	Price path	Approved December 1998. Revision approved November 2002 for a 5-year access arrangement period with retention of net capital and operating cost variances on a rolling 5-year term.
South Australia Natural Gas Transmission Pipelines				
Moomba to Adelaide Pipeline System	Epic Energy Pty Ltd	ACCC	Price path, with rebates for revenue from Interruptible Services.	Approved July 2002, with appeal determined December 2003 by Australian Competition Tribunal on access arrangement drafted by ACCC for an access arrangement period to 31 December 2005 with retention of variances to end of period.
South Australia Natural Gas Distribution Systems				
SA Gas Distribution System	Envestra Limited	SAIPAR	Price Path	Approved April 2003, with 5-year access arrangement period with retention of variances until end of 2 nd 5-year period.

Western Australia Natural Gas Transmission Pipelines				
Dampier to Bunbury Pipeline System	Epic Energy (WA) Nominees Pty. Ltd.	Economic Regulation Authority (Authority)	Price path, with rebates for revenue from Rebatable Services.	Approved December 2003, subject to appeal on 5-year access arrangement period with retention of variances at least to end current access arrangement period 31 December 2004. Formulae for portion of revenue retained from sale of a number of Rebatable Services.
Tubridgi Pipeline System - Tubridgi Pipeline & Griffin Pipeline - Tubridgi to DBNGP	Sagasco SE Inc	Economic Regulation Authority (Authority)	Price path, with rebates of Rebatable Services revenue over specified amount.	Approved October 2001, for a 5-year access arrangement period with retention of variances for initial period and prior operating cost savings shared over next period by tariff glide path.
Goldfields Gas Pipeline System	Goldfields Gas Transmission Pty Ltd	Economic Regulation Authority (Authority)	Proposed as price path, escalated by CPI.	Draft decision pending. Proposal is 5-year access arrangement with levelised tariffs on NPV basis, with retention of variances for period.
Kalgoorlie to Kambalda Pipeline	Southern Cross Pipelines Australia Pty. Ltd.	Economic Regulation Authority (Authority)	N/A	Proposed access arrangement to be submitted 1 July 2006.
Western Australia Natural Gas Distribution System				
Mid West and Sth West Gas Distribution Systems	Alinta Ltd	Economic Regulation Authority (Authority)	Price path	Approved July 2000, with 5-year access arrangement period with retention to end of period.
Northern Territory Gas Transmission Pipelines				
Amadeus Basin to Darwin System	NT Gas Pty Ltd	ACCC	Price path, CPI-X.	Approved March 2003, for access arrangement to June 2011 with retention of variances to end of period.