

Discussion Paper

Asset Valuation in Gas Distribution

May 1999

SUBMISSIONS

The Queensland Competition Authority (the Authority) considers public involvement to be an important element of its decision making processes. It therefore invites submissions from interested parties concerning its investigations into the issue of asset valuation with respect to gas distribution networks.

Written submissions should be sent to the address below. While the Authority does not require submissions in any particular format, it would be appreciated if two printed copies are provided together with an electronic version on disk (Microsoft Word format) or by email.

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The closing date for submissions is **Friday 18 June 1999**.

Confidentiality

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

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

Public access to submissions

Subject to the above, submissions will normally be made available for public inspection at the Brisbane office of the Authority (see below), or on its website at www.qca.org.au.

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

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*Attachment: Process to Amend the National Third Party Access Code for Natural
Gas Pipeline Systems*

1. INTRODUCTION

The Queensland Competition Authority (the QCA or the Authority) is a statutory body established under the *Queensland Competition Authority Act 1997* (the Act). The Act gives the Authority certain responsibilities and functions with respect to National Competition Policy (NCP). Broadly, these include:

- subject to reference or declaration by the Ministers (the Premier and the Treasurer), undertaking prices oversight of monopoly or near monopoly Government business activities;
- receiving and investigating competitive neutrality complaints against significant Government and local government business activities;
- accrediting significant Government and local government business activities as complying with the principle of competitive neutrality;
- overseeing and arbitrating third party access to infrastructure; and
- undertaking such other activities relating to NCP as the Ministers may direct.

With respect to natural gas, the Authority has particular responsibilities as outlined in the *Gas Pipelines Access (Queensland) Act 1998* (subject of course to the Act being proclaimed). This Act encompasses and gives effect to the *National Third Party Access Code for Natural Gas Pipeline Systems* (the Code). The Act and the Code provide for the Authority to approve access arrangements for certain 'covered' gas distribution networks in Queensland, with access to gas transmission regulated by the Australian Competition and Consumer Commission (ACCC).

The Act was passed by the Queensland Parliament in May 1998, but is yet to be proclaimed (i.e. given effect to), pending consideration by the National Competition Council (NCC) of the effectiveness of the Queensland third party access regime for natural gas pipelines. Proclamation is expected around mid to late 1999. Once proclaimed, owners of gas distribution networks will have 90 days to submit formal access arrangements to the Authority for approval. Once submitted, the Authority has a further six months, during which there will be two formal public consultation processes, to consider the access arrangements and issue a final decision.

The Act also provides for the progressive introduction of contestability for gas consumers in Queensland. Consumers of more than 100 terajoules of gas per annum will be able to choose their supplier from 1 January 2000, with all other consumers becoming contestable from 1 September 2001. Access arrangements should ideally be in place by 1 January 2000 if competition between suppliers of gas is to occur from this date.

If, as expected, the Act is not proclaimed until mid to late 1999, the nine month timeframe for submission and approval of access arrangements will extend past the scheduled introduction of contestability. Consequently, the Authority has commenced work on a range of key issues with the aim of condensing this process such that it can approve access arrangements as soon as possible. By way of comparison, the Victorian gas distribution access arrangements were submitted in November 1997, with a draft decision released in May 1998 and a final in October 1998.

In simple terms, an access arrangement defines the group of services that together constitute access and stipulates a price for those services (the reference tariff). The reference tariff therefore sets a price to all users for a defined set of services.

In preparing for the formal submission of access arrangements, the Authority will be publishing a series of papers regarding elements of access critical to its understanding and approval of these arrangements as a focus for public submissions on these issues. This paper, the first in the series, relates to asset valuation. The Authority is interested in seeking views on the various issues raised in the paper, as an input to the Authority's consideration of asset valuation in the context of access arrangements. The Authority's position on asset valuation will not be final or binding, pending the formal rounds of consultation required once the access arrangements have been lodged.

Under the provisions of the Code, there are a number of approaches to valuing the physical assets of a firm. Each methodology is likely to provide different asset values and, consequently, different prices and incentives in related markets. There is no single rule or model that can be applied and no single 'correct' answer that can be identified.

In adopting a particular approach, the Authority will be seeking to strike a balance between the interests of users, in ensuring competitive outcomes, and infrastructure owners, in ensuring an adequate return on investment.

2. ASSET VALUATION AND THE NATIONAL THIRD PARTY ACCESS CODE FOR NATURAL GAS PIPELINE SYSTEMS

In approving access arrangements for Queensland gas distribution networks, the Authority must abide by the requirements of the Code. Section 8 of the Code sets out the required principles for the determination of reference tariffs, including principles for:

- establishing the initial capital base;
- valuing investment in new facilities; and
- reducing the capital base where assets cease to contribute, or make a reduced contribution, to the delivery of services.

There is no single required valuation methodology for existing pipelines, with the Code potentially allowing for a multitude of differing approaches. However, while there is flexibility regarding the chosen methodology, the Code notes that the final value should normally lie between a minimum of depreciated actual cost (DAC) and a maximum of depreciated optimised replacement cost (DORC), with consideration given to the advantages and disadvantages of each. The capital base then remains unchanged over the life of the assets, excepting adjustments for new facilities, depreciation and redundant capital.

The Code requires a range of issues to be considered when establishing the initial capital base for existing pipelines, including:

- well recognised asset valuation methodologies;
- international best practice and the impact of asset valuation on the international competitiveness of energy consuming industries;
- the basis on which tariffs have been set in the past (including economic depreciation and historical returns);
- reasonable expectations of persons under the regime that applied prior to the commencement of the Code;
- impact on the economically efficient utilisation of gas resources;
- comparability of the cost structure of a new pipeline which may compete with an existing pipeline;
- the price paid for any asset recently purchased by a service provider; and
- any other factors the regulator may consider relevant.

For those pipelines built after the commencement of the Code, the initial capital base is set at the actual capital cost of those assets at the time they enter service. There are provisions to allow for some portion of this value not to be included in the base at the time of construction, where certain efficient investment criteria are not met. This enables investors to increase the capacity of new investment beyond that which is currently needed, i.e. with a view to the longer term, with only the currently used part of the new investment to be included in the asset base at the time of construction. The remainder of the new investment can be progressively added as it comes into use.

Different valuation methodologies can therefore potentially be applied to new versus existing pipelines, with a replacement cost methodology possible for existing assets but only actual cost to be used for new assets.

3. APPROACHES TO VALUING THE ASSET BASE

Where valuation is divorced from the competitive market, there is no necessarily correct procedure for valuing assets. Numerous methods of asset valuation are available, and are widely used in differing circumstances by both the private and public sectors for different reasons. However, for determining the value of the underlying regulatory asset base, these methods can be characterised under two main approaches, *cost based* and *value based*.

Cost based approaches relate the value of an asset to the cost of purchasing the asset or the service potential embodied in the asset, either at the original cost or the original cost adjusted to reflect its current cost.

Value based approaches determine the value of an asset largely from its cash generating capacity. This can be measured by the net present value of future cash flows or the cash generated by selling the asset (i.e. economic value).

A third *hybrid* approach considers both value and cost based approaches to arrive at an asset value.

3.1 Cost Based Approaches

Historical Cost

Historical or *actual cost* uses the actual dollar cost of acquiring the asset, including the relevant financing cost during construction and installation, as the value of the asset. Capital assets are therefore valued at their original cost less accumulated depreciation, termed 'depreciated actual cost' (DAC) or written down value. DAC or historical cost has been a widely accepted method for public reporting purposes in the private sector.

A variant of the historical cost approach, *inflation adjusted actual cost*, attempts to adjust the asset value for inflation. This can be done by revaluing assets according to some broad indicator of the price level (e.g. CPI).

Reproduction Cost

Reproduction costs are those costs required to reproduce the existing plant in substantially its present form using the production technology and specifications of the original asset. This approach is most relevant where a similar asset is available and the existing asset still represents significantly unchanged technology.

Replacement Cost

The *replacement cost* of an asset is an estimate of the current cost of replacing the asset with similar assets, which can provide equivalent services and capacity to the asset being valued. That is, it measures what it would cost today to provide an asset to deliver the same service potential as the asset being valued. As this methodology measures the value of an asset at its opportunity cost, it is widely regarded as providing a more relevant measure of costs for the purpose of decision making.

Depreciated Replacement Cost

Depreciated replacement cost adjusts replacement cost to account for the age of the assets, i.e. through depreciation. This method therefore estimates the net current cost of replacing the asset in its current (partly worn out) state with an asset which has a similar service potential. Asset replacement costs need to be depreciated where the existing asset's remaining service life is less

than the life that would normally be expected from a new asset. The depreciation effectively recognises the limited remaining life.

Optimisation

Assets may exhibit excess capacity, be over-engineered, be sub-optimally designed (e.g. having regard to technological advancements) or be poorly located. Consequently, a valuation system may incorporate an *optimisation* process to evaluate whether physical assets are in excess of current requirements.

The process of optimisation is about identifying the most efficient facilities necessary to produce a specified level of services. By removing excess capacity and redundant services from the valuation process, and reconfiguring the network to remove any poor locational decisions, values are set based on the most efficient configuration of assets that could be used to deliver the service. Depreciated Optimised Replacement Cost (DORC) therefore measures the cost of replicating assets in the most efficient way possible, from an engineering perspective, while allowing for the age of the existing assets through depreciation.

DORC effectively sets a maximum value that can be placed on assets, because unless legally prohibited, any valuations higher than DORC would enable a competitor to bypass the assets (e.g. by duplication of the network or some section of it).

The application of DORC involves the following steps:

- optimising the distribution system;
- calculating the optimised replacement cost of the asset base; and
- determining asset depreciation.

3.2 Value Based Approaches

Net Realisable Value (NRV)

The *net realisable* or *fair market* value is simply the price at which an asset will sell in a competitive open market. This reflects the value of an asset in its next best alternative use.

Net Present Value (NPV)

The *net present value* or *discounted cash flow* approach values an asset as the present value of the predicted cash flows generated from the use of the asset. This involves estimating the future income generated from an asset and then discounting the income streams at a rate which reflects the risks involved in owning the asset. The present value of the predicted future income stream then becomes the current value of the asset. This method is widely used in valuation for investment purposes.

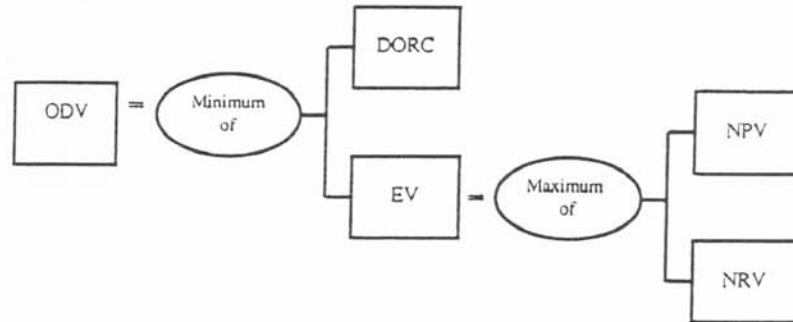
3.3 Hybrid Approach

Deprival Value (DV)

Deprival value is defined as the cost to an entity if it was deprived of an asset. Assets are valued at an amount that represents the entire loss, both direct and indirect, that may be incurred by an entity if deprived of the service potential or future economic benefits of the asset.

As illustrated in Figure 1, *optimised deprival value* (ODV) is measured by the lesser of DORC and the economic value (EV) of the asset, where the latter is the maximum of the asset's net present value or net realisable value.

Figure 1: ODV Valuation¹



The Council of Australian Governments has agreed that deprival value should be the preferred approach to valuing network assets for public reporting (as opposed to pricing) purposes. As this methodology is consistent with the National Performance Monitoring sub-committee report and with Australian Accounting Standards, it has now been widely adopted by government business entities at all levels of government. Detailed guidelines have been issued by a number of State Treasuries to facilitate implementation of the deprival concept to asset valuation. In Queensland, deprival value has been adopted for valuing and reporting the physical assets of public sector entities.

¹ NZ Ministry of Commerce (1998), *Handbook for Optimised Deprival Valuation of Electricity Line Businesses*, p. 3.

4. DISCUSSION TOPICS

4.1 Choice of Asset Valuation Methodology for Existing Assets

The Authority notes that, consistent with the requirements of the Code with respect to the facilitation of a national market, in making decisions with respect to asset valuation it will need to be cognisant of both the approaches adopted by other jurisdictions and those adopted in other industries within the energy sector (particularly electricity).

DAC has several advantages as an asset valuation methodology, including:

- it is relatively inexpensive to establish and simple to administer so long as asset registers are complete and data is comparable across assets and time;
- it reduces the risk of technological change for asset owners. When an investment is made, the schedule of allowed returns under DAC depends solely on the depreciation schedule set by the price setting body. In contrast, the allowed returns under other current cost methodologies will vary whenever relevant input prices or the prices of alternative technology change;
- for assets with a relatively brief useful life, DAC provides the advantage that it is consistent with a real measure of current cost and also represents the basis on which the owner assessed the potential returns and expended capital; and
- it avoids the costs and subjectivity associated with determining current asset values.

However, there are also several disadvantages associated with DAC, including the fact that calculations require historical data from asset registers that may be incomplete or non-existent, as well as difficulties associated with the different accounting standards on capitalisation and rates of depreciation when considering very long periods of time. In addition:

- DAC, especially in the case of long-lived assets, may have little or no relationship with market values or replacement costs. For example, persistent inflation causes capital valuation and capital costs to be underestimated relative to current values. DAC also takes no account of technological obsolescence; and
- valuations based on DAC would make tariffs dependent on asset age and could lead to price shocks when assets are replaced.

DORC has several advantages, including:

- it ensures that obsolete, poorly sized or poorly located assets are not included in the capital base and consequently are not paid for by users;
- it allows for technological change (i.e. assets can be valued in a way that reflects current technology rather than outdated technology); and
- it addresses a major problem of DAC, namely, the incompatibility in relating historical values for capital assets and capital costs with current values for other expenses and revenues.

Disadvantages of DORC include:

- examination and assessment procedures are costly and more subjective judgement is required in determining the optimal network configuration and the degree of excess capacity deemed to be 'efficient'; and
- the complexity of the process may be magnified by the asymmetry of information between the price setting body and the network owner.

Optimised deprival value applies the minimum of DORC or economic value. Advocates of the deprival methodology argue that this approach better aligns asset valuations with those produced in a competitive market. In practice, if DORC exceeds EV, an owner would not replace the asset because the present value of future earnings would be less than the cost of replacing the asset. Alternatively, if EV exceeded DORC, the present value of future earnings would exceed the cost of replacing the asset.

In addition to the advantages associated with using DORC, deprival value may result in a more accurate value for an asset in an environment where a full DORC valuation provides an asset value, and consequently a price, that cannot be supported by the market. In some circumstances, the resulting asset value has been expressed as a percentage of the full DORC calculation.

However, the use of economic value concepts (e.g. NPV or NRV) can have circularity problems. In a regulated market, the asset value is used as an input in calculating the revenue requirement, and consequently the price. Subsequently, any attempt to use the price to determine an asset value, which in turn is used as an input into the price, suffers from a problem of circularity. To the extent that there is competition in the market, e.g. from other networks or other energy sources, determination of a market based price may be possible, which may mitigate this circularity problem.

The Authority invites comment on the use of the different asset valuation methodologies outlined in this paper, and in particular DAC, DORC and ODV, including their implications for investment and pricing decisions and any potential difficulties with their implementation.

4.2 Difficulties Associated With the Code's Approach to Asset Valuation

As noted in section 2, the Code allows for different valuation methodologies to be applied to new and existing pipelines. This raises a number of issues.

One of the asset valuation methodologies permitted under the Code is DORC. The primary rationale for using DORC to value assets, in preference to actual costs, is based on the belief that it provides a greater indication of the current value of the assets to the owner, and is therefore more reflective of the value that would be ascribed to an asset in a competitive and contestable market. This makes such a value a more relevant measure for the purposes of decision making.

Under a DORC methodology, it is generally assumed that revaluations of the capital base will periodically occur to ensure that asset values genuinely reflect current costs, and remain relevant over time despite inflation and the potential for obsolescence. However, the Code, in contrast, does not provide for revaluations, holding the initial capital value as fixed once it is initially calculated, irrespective of whether DORC is used as a valuation methodology or not.

The Authority invites general comment on the implications of the use of DORC (or any current cost methodology) as a valuation methodology for existing assets, versus using actual cost for new assets, given that periodic revaluations are not permitted under the Code.

If DORC is accepted as a valuation methodology, then as there is no allowance for revaluation in subsequent periods, any portion of an existing asset which is excluded from the initial DORC calculation cannot be incorporated back into the asset base even though it may contribute to service provision in the future. This means that while some part of existing assets excluded from the asset valuation exercise can, over time, make a contribution to service provision, these assets will not appear in the asset base, and prices cannot be increased to provide for a return on these additional assets. In effect, the value of these assets cannot be recovered by asset owners once excluded from the initial DORC calculation.

In contrast, similar assets constructed after the time that DORC is calculated can be included or excluded from the asset base depending on their contribution to service provision.

Similarly, if EV is used as a valuation methodology under ODV, some portion of asset values under DORC will be excluded from the asset base. Again, under the Code, once these assets are excluded they cannot be reincorporated into the asset base at a future point in time.

By comparison, the National Electricity Code permits revaluation of assets on a basis to be determined by the Jurisdictional Regulator. This raises questions of the possible divergence of approaches to asset valuation between these two industries, creating potential arbitrage opportunities and distorting investment decisions.

The Authority invites comment on the issue of the impact of not allowing periodic asset revaluations on both investment and pricing, i.e. the financial position of infrastructure owners and prices to users.

Should it be concluded that revaluation of assets is a relevant issue, there are a range of possible solutions that could be pursued. The first of these is to change the Code to allow revaluations of the asset base. The process required for changing the Code is outlined in the Attachment. Changing the Code would require some administrative effort upfront, as the agreement of all states would need to be sought, and may take some time, prolonging the uncertainty over this major issue given that Queensland's access arrangements are targeted to be in place by the end of this year. In addition, given that several other states already have access arrangements in

place, and that the issue of under utilised assets is far less significant in these states, it may be difficult to secure support for a Code change.

Given that there may be impediments to changing the Code, a range of other potential solutions may need to be explored.

One such option is to set a DORC asset value equivalent to the replacement cost of existing assets, irrespective of the fact that this may set a price which is not sustainable in the market (i.e. irrespective of the economic value of those assets). Infrastructure owners would then have an incentive to grow the market to increase prices and revenues to a commercially sustainable level. However, whether prices can ever reach such a level is currently unknown.

Although it may not be commercially viable at present to set tariffs based on a full DORC valuation, it may be argued that the regulated tariff should represent a ceiling under which access would be negotiated. This would give asset owners the opportunity to recover the full value of their investment over time, even if prices in the short run would not support these asset values.

This approach suffers from the problem that the price set would not be used as a reference tariff. This would result in all users having to negotiate an access price, rendering the access arrangement ineffective. Ideally, the regulated price should set a realistic benchmark for the majority of users, thus minimising transaction costs in the market.

A second option is to set a transition path that enables the value of the assets, and reference tariffs, to be increased as asset utilisation increases and market prices become more able to support replacement cost. The Code has limited scope in terms of allowing transition paths, with such an approach permitted during an access arrangement period, but based on the standard requirements of the Code with respect to asset valuation and pricing. This means that prices can vary within an access arrangement period, but over the totality of that period, revenue must still be sufficient to cover costs based on the agreed asset valuation.

A transition path approach to this issue may therefore require amendments to either the Code or the accompanying legislation. Changing the Code may be a difficult exercise, as noted above. In terms of legislative changes, South Australia has made amendments to their legislation to allow for transition paths as a means of unwinding cross subsidies. A similar approach could be employed in Queensland, although whether a transition path could be set to address the issue of asset value in addition to cross subsidies is currently unknown. This approach potentially allows asset owners to recover a greater proportion of the replacement cost of their assets over time, with prices to users commensurately rising as the asset value increases.

A final potential approach is similar to that adopted by IPART. This involves setting a real, pre-tax Weighted Average Cost of Capital and then indexing the existing capital base, effectively allowing increases in asset values based on inflation. While this in part solves the issue of the asset value reflecting current costs, it would not appear to address the issues raised above.

The Authority invites comment on whether the issue of periodic revaluation of assets needs to be addressed, and which of the above approaches, or any alternative approach, would best resolve these issues.

ATTACHMENT

PROCESS TO AMEND THE NATIONAL THIRD PARTY ACCESS CODE FOR NATURAL GAS PIPELINE SYSTEMS

The National Third Party Access Code for Natural Gas Pipeline Systems (the Code) was signed as part of an intergovernmental agreement in November 1997. The *Gas Pipelines Access (Queensland) Act 1998* provides that the Code comprise part of the Gas Pipelines Access Law in Queensland.

The Code may be amended by agreement between the relevant Ministers of scheme participants. Queensland is currently a scheme participant, although should the *Gas Pipelines Access (Queensland) Act 1998* not be proclaimed by 18 May 1999 (within one year of the South Australian Act being enacted), the other scheme participants have the option of declaring Queensland to no longer be a participant. (While the legislation has not been proclaimed, a regulation has been passed extending the time frame for proclamation until May 2000.)

The National Gas Pipelines Advisory Committee (NGPAC) provides a forum for discussing proposed changes to the Code. NGPAC has representatives from government and industry bodies, including the Queensland Government. The next meeting is tentatively scheduled for August/September.

Under the provisions of the Code, the basis of a change to the Code must be a report of NGPAC which recommends changes to Ministers, and provides reasons why these changes are needed. Agreement must occur within eight weeks of the report being provided. Any dissenting views of NGPAC members must also be noted. If changes to the Code are considered by NGPAC to be significant, a public consultation process must take place before a report is prepared for relevant Ministers.

Schedule 1 to the South Australian Act states that agreement to change the Code must be made by all the relevant Ministers. Agreement may be made by two thirds of relevant Ministers if the change does not amend a core provision of the Code and does not insert a provision dealing with a matter not previously dealt with by the Code.