2.1 Reference tariff methodology

Section 8 of the Code contains the general objectives for a reference tariff and certain factors about which the relevant regulator must be satisfied before approving reference tariffs and the reference tariff policy. Reference will be made to the relevant parts of section 8 where appropriate in the following sections where the basis for the reference tariffs proposed in the access arrangement are considered. In addition, a discussion of reference tariffs and the reference tariff policy in relation to sections 8.1, 8.2 and *3.5* of the Code is provided in section 2.11 of this ***Draft Decision.***

2.1.1 Code requirements

The reference tariff principles of section 8.4 of the Code permit a choice of three methodologies for determining the total revenue:

- cost of service: where the total revenue is set to recover costs with those costs to be calculated on the basis of a return (rate of return) on the value of the assets that form the covered pipeline (capital base), depreciation on the capital base (depreciation) and the operating, maintenance and other non-capital costs (non-capital costs) incurred in delivering all services;
- internal rate of return (IRR): where the total revenue is set to provide an acceptable IRR for the covered pipeline on the basis of forecast costs and sales; and
- net present value (NPV): where the total revenue is set to deliver a NPV for the covered pipeline (on the basis of forecast costs and sales) equal to zero, using an acceptable discount rate.

While these methodologies are different ways of assessing the total revenue, their outcomes should be consistent (for example, it is possible to express any NPV or IRR calculation in terms of a cost of service calculation by the choice of an appropriate depreciation schedule). In addition, other methodologies that can be translated into one of these forms are acceptable under section *8.5* of the Code.

Section *8.3* of the Code provides that a reference tariff may be designed on the basis of a price path approach. Under this approach, reference tariffs are determined in advance for the access arrangement period to follow a path that is forecast to deliver a revenue stream calculated consistently with the principles in section 8, but is not adjusted to account for subsequent events until the commencement of the next access arrangement period.

Section 8.5A of the Code allows the above methodologies to be applied on a nominal basis, a real basis or any other basis dealing with the effects of inflation.

2.1.2 EAPL's proposal

EAPL has proposed the following tariff principles and policies in developing its reference tariffs:[16]

[16] Access arrangement, pp. 9-10.

- a current cost accounting (CCA) methodology is used to determine the revenue requirement;
- the initial capital base is valued by the application of the depreciated optimised replacement cost methodology (DORC);[17]
- a pre-tax real rate of return of 8.4 per cent is applied to the initial capital base;
- the rate of return is set to provide EAPL with a return commensurate with prevailing conditions in capital markets and with the risks involved in providing the reference services;
- reference tariffs are structured to reflect the forecast costs of providing the reference services;
- total costs are to be recovered from users of Class FT service and Class STP service, who will be eligible for rebates from rebatable services; and
- reference tariffs are to reflect the distance the gas is transported through the pipeline.

Furthermore, EAPL proposes to adopt a smooth price path whereby reference tariffs will be adjusted each year of the initial access arrangement period in accordance with a CPI-X formula. The stated objective of the price path approach is to avoid price shocks for users.

During the access arrangement period, reference tariffs will only be adjusted for:

- new or increased taxes, charges, levies, imposts or fees; and
- inflation (Consumer Price Index (CPI) – All groups average of eight capital cities as published by the Australian Bureau of Statistics (ABS)).

EAPL also proposes that in the event that the ABS suspends or ceases publication of, or materially alters the CPI, EAPL will substitute an alternative which reflects changes in consumer prices.[18]

Within the CCA framework, EAPL has proposed that target revenue be calculated so as to provide a real rate of return (that is a real WACC) on an asset base that is indexed for inflation. Consistent with this approach, the capital base and any new facilities investment are indexed for an estimate of inflation for the purposes of setting the capital base at the commencement of the next access arrangement period.[19]

EAPL proposes to adopt a combination of approaches, primarily a cost of service model based on forecast costs combined with a price path approach during the access arrangement period. This combination of approaches is permitted under section 8.3(c) of the Code.

The approach proposed by EAPL includes the following steps:

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[17] **EAPL** originally proposed a DORC methodology based on straight line depreciation. Agility Management Pty Ltd on behalf of the Australian Pipeline Trust, in a subsequent submission proposed an alternative methodology for calculating DORC. This issue is discussed in detail in section ***2.2*** of this ***Draft Decision.***

[18] Access arrangement, p. **29.**

[19] Access arrangement information, p. 19.

Step 1: Set target revenues

A target revenue figure is calculated for each year of the initial access arrangement period, that is from 2001 to 2005. This is based on forecasts of costs comprising a nominated return on assets, depreciation of the capital base, and operating, maintenance and other non-capital expenses incurred in delivering all services. Proposed capital expenditure is also integrated into these forecasts.

Step 2: Apportion revenues to tariff components

The target revenue for each year is apportioned between the four reference tariff FT components: mainline capacity; mainline throughput; lateral capacity and lateral throughput. This apportionment, based on the nature of the underlying costs, is then adjusted to avoid excessive tariffs on the laterals which could cause hardship for some customers.

Step 3: Set formulae for tariff adjustments from year to year

The price control formula (CPI-X) proposed by EAPL sets the tariffs for reference services over the four years of the access arrangement period following the initial year. The initial tariff is set with reference to the published tariffs applicable at the time EAPL submitted its access arrangement period. Setting the initial tariff on the basis of published tariffs and adopting a smooth price path facilitates EAPL's objective of avoiding price shocks at the commencement of the subsequent access arrangement period, assuming continuity of tariff setting principles.[20]

The value of X is determined so that the NPV of the forecast revenue (tariffs multiplied by volumes) is equivalent to the net present of the target revenues (based on forecast costs) for the access arrangement period. Thus EAPL neither over or under recovers revenue by adopting a price path approach as opposed to tariffs based each year on a strict cost of service approach.

2.1.3 Submissions by interested parties

No submissions discussed this overall methodology. Instead, submissions tended to focus on individual parameters underlying EAPL's proposed tariffs, such as the value of the initial capital base and the rate of return.

2.1.4 Commission's considerations

EAPL has chosen to base its proposed tariffs on a cost of service methodology which is permitted under the Code. Similarly, the Code permits the use of the CCA framework. Consequently, the Commission has no objection to the overall methodology adopted by EAPL. The Commission considers the adoption of the smoothing mechanism is acceptable as it does not increase the NPV of the revenues determined by the cost of service approach.

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[20] Access arrangement information, p. 55.

2.2 The initial capital base

2.2.1 Code requirements

The initial capital base – existing pipelines

For existing pipelines, the Code (sections 8.10 (a) and (b) and 8.11) requires that normally the value of the initial capital base should not fall outside the range of depreciated actual cost (DAC) and depreciated optimised replacement cost (DORC). In establishing the initial capital base, the Code (section 8.10) also requires the Commission to consider:

- other well recognised asset valuation methodologies (section 8.10(c)) and the advantages and disadvantages of these methodologies (section 8.10(d));
- international best practice and the impact on the international competitiveness of energy consuming industries (section 8.10(e));
- the basis on which tariffs have been (or appear to have been) set in the past, the economic depreciation of the covered pipeline, and the historical returns to the service provider from the covered pipeline (section 8.10(f));
- the reasonable expectations of persons under the regulatory regime that applied to the pipeline prior to the commencement of the Code (section 8.10(g));
- the impact on the economically efficient utilisation of gas resources (section 8.10(h));
- the comparability with the cost structure of new pipelines that may compete with the pipeline in question (for example, a pipeline that may by-pass some or all of the pipeline in question) (section 8.10(i));
- the price paid for any asset recently purchased by the service provider and the circumstances of that purchase (section 8.10(j)); and
- any other matters considered relevant (section 8.10(k)).

General principles

In addition, the Commission is guided by the objectives in section 8.1:

(a) providing the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivering the Reference Service over the expected life of the assets used in delivering that Service;

(b) replicating the outcome of **a** competitive market;

(c) ensuring the safe and reliable operation of the Pipeline;

(d) not distorting investment decisions in Pipeline transportation systems or in upstream and downstream industries;

(e) efficiency in the level and structure of the Reference Tariff; and

(f) providing an incentive to the Service Provider to reduce costs and to develop the market for Reference and other Services.

New investment

The principles used for determining the valuation of the initial capital base, as contained in section 8.10 of the Code, do not apply to new investment.[21] The value of new investment is the actual capital costs (subject to a test of prudency for new facilities investment relating to existing pipelines) of the assets at the time that they first enter service. Proposed new investment for the MSP is covered in section 2.3 of this ***Draft Decision.***

2.2.2 EAPL's proposal

EAPL is proposing a value for the initial capital base of $666.7 million, which includes a valuation of the pipeline system as well as allowances for working capital and 'access arrangement costs'. The valuation of the pipeline system is calculated in accordance with the DORC methodology which represents the upper limit acceptable under the Code.

Inherent in EAPL's DORC calculation is an assumed life of 60 years for the Moomba to Wilton section of the pipeline and 80 years for other sections. **A** shorter life has been assumed for the Moomba to Wilton section because of deterioration due to stress corrosion cracking and the older technology used in constructing the pipeline. The DORC for the Moomba to Wilton section has been calculated as 36/60ths (or 60 per cent) of the ORC (36 years is the remaining life).

Subsequent to EAPL's original proposal, APT submitted that the life of the Moomba to Wilton section could be extended to 80 years through refurbishment by re-coating the pipeline in areas where the coating has deteriorated. APT's projected cost of the refurbishment is $560 000 per km for 250 km between the years 2033 and 2056.[22]

Furthermore, Agility on behalf of the APT, has submitted an alternative methodology for estimating DORC.[23] The merits of the alternative DORC methodology and its relevance to the initial capital base for regulatory purposes are discussed later in this section.

EAPL has put forward several arguments in support of its proposed use of DORC, which include:

- DORC is consistent with an efficient new entrant. Accordingly, no user would be charged greater than its stand alone cost and so would not have the incentive to by-pass the pipeline;
- the optimisation process allows the benefits of new technology to be passed on to users and prevents the service provider from passing on the costs of inefficient investments;
- DORC is consistent with the outcome that would result from a competitive market and is consistent with a hypothetical liquid second-hand market for the assets;

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[21] **In this context new investment includes extensions and expansions of existing facilities** and **new pipeline systems.**

[22] **APT submission, 21 September 2000, p. 2.**

[23] **Agility proposal on behalf of APT, 18 August 2000.**

- as revenue emanating from the application of the DORC methodology will be less than the revenue stream that EAPL currently earns, users will be protected from price shocks; and
- under the DORC methodology new and existing assets are treated consistently.

The Agility approach

Agility proposed an alternative methodology for constructing the DORC valuation from the estimated ORC. Agility draws on statements made in past reports by the Commission, and in particular the ***Draft Regulatory Principles,*** to support its alternative approach. Broadly, Agility emphasises that the DORC derivation from ORC should be independent of the past or proposed frameworks for establishing tariffs. Instead, the value should be based on the NPV of revenues that could be generated by the assets over their remaining useful life as if tariffs were set on the basis of what would be charged by a new entrant in a contestable market.

As the new entrant would be constrained in **a** contestable market by the costs of other potential entrants the tariff and revenue profile over time would need to reflect the impact of changes in their costs, particularly replacement costs.[24] The outcome of applying this approach is that, for reasonable assumptions about the rate of technological change, the DORC value begins to deviate significantly from the ORC estimate only towards the end of the life of the asset. According to Agility, the DORC value for the MSP determined on this basis would be in excess of $900 million. Agility's approach is concerned with establishing the value of DORC, which under the Code is normally the upper limit of the value of the initial capital base. However, Agility acknowledges that the regulator must also take other factors into account when setting the value of the initial capital base.

Optimised replacement costs

EAPL engaged Venton and Associates Pty Ltd to report on the optimised replacement costs (ORC) of the MSP.[25] The following is a summary of the methodology used to estimate the ORC of the MSP:[26]

- a forecast was prepared of quantities of gas to be hauled through each element of the pipeline system for the 15 year period to 2014;
- alternative pipeline system configurations were identified, each of which had the capacity to transport the forecast quantities;
- standard costings were prepared for the alternative configurations based on efficient cost and best practice technology;

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[24] If there were no cost changes over time, the revenue stream would take the form of an annuity. However, if there were technological changes taking place continuously there is likely to be a downward movement in revenues over time, at least in real terms. If costs (e.g. materials and construction) were increasing at a faster rate than inflation, revenues and tariffs could be expected to increase in real terms over time. Such modifications to annuities are sometimes referred to as 'tilted annuities'.

[25] Venton and Associates Pty Ltd, ***Optimised design and cost estimate EAPL pipeline network, 20*** June 1999 (the Venton report).

[26] Access arrangement information, p. 27.

- an optimum configuration was selected, corresponding to the configuration with the lowest NPV of forecast capital and operating costs; and
- the optimum configuration suitable for the 15 year horizon was reduced to that required for the commencement of the access arrangement period by removing compressors to achieve the required capacity.

The ORC estimates were prepared in March 1999 dollars. No adjustment has been made to convert the estimates to July 2000 dollars on the assumption that productivity improvements will have offset the effect of inflation.

The ORC values for each type of asset were reduced by the notional accumulated depreciation (on a straight line basis) to date to arrive at the DORC values. The DORC values proposed by EAPL are shown in Table 2.1. The total ORC for the MSP proposed by EAPL ($1 058.6 million) differs slightly from the ORC determined by Venton and Associates Pty Ltd ($1 058.2 million) in its report (the Venton report).

Table 2.1: EAPL's proposed asset values, as at 1 July 2000

	ORC ($m)	DORC ($m)	Original life (years)	Remaining life (years)
Asset type				
Pipelines - Moomba to Wilton	819.9	491.9	60[(a)]	36[(a)]
Pipelines - Young to Culcairn	59.4	50.4	80	68
Pipelines - laterals	*90.8*	76.9	80	68
Compressors	58.1	32.9	30	17
Metering	14.0	4.7	**15**	5
Plant, machinery, equipment	10.3	4.8	15	7
Mobile equipment	6.0	3.0	10	5
Total	1058.6	664.6		
Pipeline segment				
Moomba to Wilton	893.0	530.3		
Young to Culcairn	64.1	53.3		
Dalton to Canberra	19.5	15.1		
Young to Lithgow	50.4	40.9		
Junee to Griffith	31.3	25.0		
Total	1058.6	664.6		
Other assets		**Value**		
Access arrangement costs		I.4	***5***	5
Working capital		0.8	na	na
Initial capital base		666.8		

Source: Access arrangement information p. 27, and Supplementary access arrangement information, p. 12.

Note: (a) 60 years is assumed for the original life of the Moomba to Wilton section (remaining life of 36 years) and 80 years for the Young to Culcairn section (remaining life **of** 68 years).

In addition to the valuation of the pipeline system, EAPL is proposing to include in the initial capital base total access arrangement costs of $1 385 000, amortised over the five years of the access arrangement period, and comprising:[27]

Labour and 'labour on costs':	**$731** 000
External costs – consultants:	$369 000
External costs – legal services:	$240 000
Support services:	$45 000

EAPL states that this represents the prudent costs of preparing an access arrangement and access arrangement information and participating in the regulatory process.

Proposed working capital of $767 000 is also included. EAPL states that this amount is equivalent to 23 days of its annual operating and maintenance costs, which is far less than the rule of thumb of 45 days adopted by many regulatory authorities in the USA, including Federal Energy Regulatory Commission (FERC).

EAPL also raises other feasible valuation methods acceptable under the Code. Below is a summary of these alternative valuation methods (a more detailed explanation is contained in EAPL's access arrangement information and supplementary access arrangement information).

Depreciated actual costs and depreciated sale price

Based on capital expenditure and book depreciation since the MSP came into operation in 1976 EAPL has calculated the DAC of the MSP at approximately $100 million. EAPL refers to this value as the 'historical cost written down value'. EAPL dismisses the 'historical cost written down value' as an appropriate value for the initial capital base as it does not, take into account under-recovery of costs since 1976. EAPL argues that a normal rate of return has not been earned since that year because of two factors:

- tariffs were set with the view to growing the market and delaying recovery of capital costs until the market could bear those costs; and
- when the MSP was owned by the Commonwealth Government, the tariffs were designed to provide a return to the Government equivalent to its cost of borrowing on the basis of 100 per cent debt financing at rates applicable to a Commonwealth statutory authority, rather than a commercial rate of return for such a project.

EAPL contrasts the situation in Canada and the USA with that in Australia. According to EAPL tariffs for many utilities in North America have been set on the basis of DAC for many decades. However, since tariffs have not historically been set on the basis of DAC, EAPL suggests that this methodology is inappropriate for establishing the value of the asset base. In EAPL's opinion, had this been the case in Australia then valuing the initial capital base on the basis of DAC would have some justification.

EAPL argues that a DAC valuation for the MSP would have a negative impact on incentives for new investment compared to a DORC valuation:

> A DAC valuation would result in **a** substantial revenue shock for EAPL by significantly reducing tariffs from current levels. If established, this would be a major precedent that

[27] Supplementary access arrangement information, p. 14.

would massively increase the level of regulatory risk facing investors in regulated assets, including both new and existing assets.[28]

EAPL goes on to state that '[i]f the regulator placed a low valuation on existing sunk assets, it is likely to dampen the incentives for future investment in the regulated industry.'[29]

From EAPL's perspective the starting point for DAC is the $531 million it paid for the pipeline assets in 1994.[30] An adjustment has been made to the acquisition cost to allow for capital additions and depreciation since 1994 to arrive at a DAC value of $473 million as at 30 June 1999. The forecast figure as at 30 June 2000 was $459 million.

Current cost written down value

The current cost written down value approach outlined by EAPL is similar to the calculations that would apply under an historical cost approach with adjustments made for inflation. EAPL estimates that a value determined on this basis would be $721.8 million dollars.[31]

Economic written down value

EAPL has determined a value for what it considers to be the economic written down value of the pipeline assets (based on various assumptions) over the whole life of the assets to date. Essentially EAPL's approach is to calculate the required return (consistent with commercial rates) and adjust the value of the assets in accordance with any over or under recovery of the required return. The value determined by EAPL using this methodology is $3.1 billion." This range is well above DORC, the upper limit of the value of the initial capital base normally allowed under the Code, regardless of what DORC methodology is applied.

Optimised deprival value

EAPL states that, however calculated, the optimised deprival value is likely to be greater than DORC as calculated above, and is therefore irrelevant in this instance.

2.2.3 Submissions by interested parties

Incitec Ltd, Australian Gas Users Group (AGUG), Boral Energy Holdings Ltd (Boral) and the Energy Markets Reform Forum commented in their submissions on EAPL's proposed asset valuation based on DORC. Incitec and AGUG favour a valuation based on a DAC methodology as opposed to an approach based on DORC.[33] Both comment on the difficulty in determining an accurate and verifiable figure for the DORC value. Conversely, they consider that an accurate and verifiable DAC value can be calculated for the MSP, as EAPL's and its predecessor, TPA's, only business in the gas industry is

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28 EAPL response to submissions, 17 August 2000, p. 2.
29 EAPL response to submissions, 17 August 2000, p. 4.
30 $534 million was paid for the assets of TPA, of which $531 million represents the MSP assets and the remainder related assets. The difference represents related assets.
31 EAPL response to submission, 17 August 2000, p. 3.
32 EAPL response to submissions, 17 August 2000, p.3
33 Incitec submission, 30 July 1999, pp. 1-9 and AGUG, 19 July 1999, pp. 2-3.

the provision of transmission services and it is not involved in any upstream or downstream activities.[34] Moreover, Energy Markets Reform Forum submitted a paper prepared by Professor David Johnstone which questions the theoretical economic arguments used to support DORC as an appropriate value for the initial capital base. In contrast Boral states that DORC has the advantage of 'avoiding distortions between equally functional assets based on the age of the asset'.[35]

Below is a summary of other concerns raised by Incitec with respect to the use of DORC and the main arguments advanced by Incitec in favour of DAC:

- the argument that DORC replicates the outcome of a competitive market can be applied with equal validity to DAC. Incitec argues that, while long run marginal costs (LRMC) considerations support a DORC valuation, prices in a contestable market are based on short run marginal cost (SRMC) for a long time, suggesting that DAC is appropriate;
- Incitec dismisses any argument that DORC minimises price shocks to gas users on the basis that, irrespective of what method is used to value the initial capital base, when the assets' life expires the value of the assets is zero;
- DORC cannot be justified as there is no certainty that the MSP will ever be replaced. Depletion of gas reserves in the Cooper Basin and potential competition from other pipelines may result in redundancy of the MSP;
- price shocks are avoided because looping, compression and sustenance capital occurs over time, rather than total system replacement at any given time;
- while agreeing that values in excess of DORC expose the pipeline owner to the risk of bypass, according to Incitec bypass is a threat in North America under a DAC regime;
- while acknowledging that DAC does not facilitate the assignment of capital cost to different groups of users to provide for cost reflectivity because of different lives of assets, Incitec argues that DORC is not a solution to this problem;
- according to Incitec, the 'economically efficient utilisation of gas resources' (section 8.10(h) of the Code) can only be achieved by minimising gas transportation costs, which in turn will only be attained by valuing the initial capital base at DAC; and
- DAC is used for valuation of assets in North America and is sufficient to encourage new investment in gas pipelines. The Commission should take this into account when assessing the impact of the asset valuation on the 'international competitiveness of energy consuming industries' (section 8.10(e) of the Code).

In its submission Epic Energy commented on the issue raised in the Commission's *Issues* ***Paper*** concerning how different operating costs between the existing assets and the optimised configuration should be accounted for in the value of the initial capital

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[34] This contrasts with the situation in Victoria prior to the reform of the gas industry in that State in which one company provided a bundled product, transmission and resale of gas. In its assessment of the transmission tariffs, the Commission was unable to unbundle the assets of the transmission business with any degree of certainty for the purpose of assessing the performance of the transmission business alone and establishing an accurate DAC figure.

[35] Boral submission, 2 July **1999, p. 3.**

base, if at all. In other words, should the value of the initial capital base be adjusted downwards when the operating costs are higher for the existing assets than the optimised configuration and, similarly, adjusted upwards when the operating costs are lower.[36] Epic Energy argues that if the valuation is based on ORC, rather than DORC, it may be appropriate to make the adjustment, but it is inappropriate in cases where the assets are depreciated."

2.2.4 Commission's considerations

Once the value of the initial capital base is established that value is then carried forward to future access arrangement periods. While the capital base may be adjusted for depreciation, new investment and redundant assets, once established it cannot be revalued at a later date. This minimises regulatory risk by eliminating the capacity of the regulator to make arbitrary changes to the value of the capital base that otherwise might reduce the confidence of investors that they will be allowed to earn an appropriate return on an investment. **As** a consequence the setting of the value of the initial capital base is a critical matter in the assessment of an access arrangement.

Interpreting the Code

The Code suggests a range of valuation approaches which should be considered when establishing the initial capital base for an existing pipeline. As is evident with the alternative DORC values mentioned above, within each approach there are various methodologies which may be applied. Given that that all yield different values the Commission must use other guidance within the Code to decide what weight should be given to each approach and methodology. The discussion that follows considers various approaches to valuation against the criteria and guidance provided in the Code. The Commission has developed its interpretation in such a way as to be consistent with the regulatory and economic principles developed elsewhere in the Code as well as preserving the intent of the Code.

A significant conclusion drawn from the Commission's interpretation of the Code is that the value assigned to the initial capital base should be a fair value to both the service provider and users of the pipeline system. That is, where the service provider has sought in the past to recover an allowance for depreciation of the assets in past tariff charges the initial capital base should be based on a residual value reflecting that extent of accumulated depreciation. If the initial capital base were set below the residual value then the service provider would suffer a windfall loss equal to the difference between the initial capital base and the residual value. If the value of the initial capital base were set above this residual value the users would be paying **a** second time for depreciation of a portion of the assets delivering what is a windfall gain to the service provider above a reasonable commercial rate of return. For the initial capital base value of the existing assets to be fair to both the service provider and users it needs to reflect a residual value based on the historic depreciation which has been recovered by the owners. The illustrative model in Appendix D of this Draft Decision demonstrates this proposition.

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[36] **ACCC, *Issues Paper*, p. 14.**
[37] **Epic Energy submission, 2 July 1999, pp. 1-2.**

Where an asset has been previously regulated the allowances for depreciation to date would be explicit and the residual value easily calculated. However, the problem of assessing the depreciation for assets that have not previously been regulated is much more difficult. A DAC valuation could be consistent with historical tariffs if early tariffs were relatively high. However, in order to allow steady development of the market and achieve efficient utilisation of the pipeline, pipeline owners have tended not to pursue high initial tariffs. Instead it ahs been more common for initial tariffs to be set at modest levels to promote market growth. The application of a current cost accounting (CCA) framework based on a real rate of return and providing for inflation through escalation of asset values is a frequently adopted approach to deliver such an outcome. EAPL has proposed such an approach in its access arrangement. **A** CCA framework is consistent with a 'real rate of return' model. The real tariffs from the model are simply adjusted for cumulative inflation to give the tariffs relevant for contractual purposes.

Replacement cost and optimisation

If gas transportation was a contestable market, it could be expected that tariffs and revenues would tend to follow the costs faced by a new entrant. Therefore, if the Code intends that pricing should reflect behaviour in a competitive market (as suggested by section 8.1(b) of the Code) the value of the initial capital base should be based on the replacement cost of the assets in question. For example, the Code (section 8.10(i)) requires the Commission to take account of:

> **The comparability with the cost structure of new pipelines that may compete with the pipeline in question (for example, a pipeline that may by-pass some or all of the pipeline in question)**

If replacement costs were rising over time then a DAC value which does not involve inflation adjustments would soon fail to be a reasonable indicator of the costs faced by a new entrant. Hence the Code identifies the DORC, a replacement based cost estimate, as the basis for establishing the initial capital base.

The replacement cost is depreciated to reflect the fact that the existing asset has already generated revenues and provided the service provider with a return of capital in addition to a commercial return on capital. It also recognises that the remaining life of the existing asset is less than that of a new replacement asset and should therefore have an appropriately discounted valuation. The question is by how much should the replacement cost estimate be notionally depreciated.

In the absence of technological change the cost of building a pipeline will tend to escalate at the same rate as inflation. Costs associated with a substitute pipeline which, in principle, could be built by a competitor would tend to rise at the rate of inflation. That is, the 'real' value of the asset would tend to be preserved apart from the allowance for depreciation. This is the time path for the regulatory asset value implied in the real regulated framework. Further, the Depreciated Replacement Cost (DRC) (no optimisation) that would be calculated at any time is precisely the regulatory asset value emerging from a CCA based framework. This direct link between the DRC valuation of existing assets and this common method for establishing tariffs provides justification for identifying the DRC value as one basis for establishing the initial capital value for an existing asset about to be regulated.

If a competitor were to consider building competing infrastructure it would be able to reduce costs by optimising the infrastructure to provide the required services in the most efficient way. It would also have access to more recent technology. As a result a competitor could establish infrastructure to provide equivalent services to those provided by the incumbent at a cost less than would be achieved simply by duplicating the existing assets. To reflect such potential competitive pressures in pricing, the Code recognises that the relevant benchmark for valuing existing assets must be the Optimised Replacement Cost (ORC) and this is the maximum benchmark that should be considered. Of course, allowance must still be made for the fact that existing assets are old and may not last as long as the replacement assets. Therefore, the code suggests the use of DORC, which applies depreciation to the hypothesised ORC on the basis that the pattern of depreciation follows that of the existing asset. In this way, it is possible to understand why the Code nominates a DORC valuation as the maximum that can be applied to existing assets and generate prices that have some correspondence with what might be observed in a competitive market.

In general, the DORC valuation would not exceed the valuation of an existing asset whose regulatory value was governed by a real regulatory framework. At first, this may appear to generate a capital loss for the owner of the assets. However, it must be remembered that the owner would be well aware of potential risks to their future revenue stream due to by-pass, technological change and the limited life of the natural resource. The owner would seek to obtain revenues incorporating a higher component of depreciation than may be suggested by the potential useful life. Typically, the owner would do this by assuming an economic life for the asset considerably less than the potential technical life of the asset. The MSP provides some evidence of this. Historic accounts suggest that assumptions of asset life ranged from 30 to 50 years.[38,39] When they were built, such projects typically were expected to have an economic life of about 50 years or less (possibly due to limited resource life).[40] By contrast the expected life of new replacement assets now appears to be 80 years.

This line of reasoning supports the use of DAC and DORC respectively as the lower and upper bounds of the value of the initial capital base to be established by the regulator.

Consideration of Agility's DORC proposal

In considering the Agility DORC proposal there are two separate issues:

- whether the proposal represents a sound theoretical construct of a DORC value from an ORC valuation; and
- whether the DORC value constructed in this way is a useful valuation to consider in the setting of the initial capital base for existing assets.

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[38] For example, **TPA** noted that its facilities 'will be fully depreciated over the life of the contract to 31 December 2006", a period of just 30 years. Source: The Pipeline Authority, **1988-89** Annual report.

[39] The depreciation indicated in the statutory accounts of EAPL are consistent with an assumed economic life of the main pipeline assets of about 50 years. This was also the assumption that EAPL used to establish third party tariffs following its purchase of the MSP.

[40] In the Victorian gas access arrangements the limited resource life was the reason for applying a faster rate of depreciation, despite the fact that alternative sources of gas are likely to utilise the same pipeline network in 50 years time.

The traditional approach to deriving a DORC from an estimated ORC has been to assume that the asset depreciates uniformly in real terms over the life of the asset. This leads to a relatively simple calculation so that the DORC is equated to a percentage of the ORC with the percentage equal to the expected remaining life of the existing asset expressed as a proportion of the expected life of an replacement asset.

The ORC to DORC methodology proposed by Agility, however, is based on the NPV of prospective cash flows that the existing assets might earn over their remaining life relative to the NPV of revenues that a new replacement asset might be expected to earn in a hypothetical contestable market. This approach is implicit in the Commission's *Draft Regulatory Principles.* In that document the Commission advocated the implied depreciation profile as a preferred mechanism for the roll-forward of the regulatory capital base over time as this would tend to generate tariffs that are independent of the vintage of the assets in use. It would minimise disparities in tariffs between different generations of assets and also between services provided by regulated assets in different regions.

However, the threat of redundancy and by-pass in the gas transmission industry could justify greater depreciation in earlier years. Therefore, straight line depreciation, which is the alternative generally proposed to achieve this, may be a more relevant approach for this industry.

The traditional DORC approach coincides precisely with the depreciation profile proposed in all access arrangements applying a building block framework and considered by the Commission to date. Thus when traditional DORC is used as the basis for the initial capital base, the regulatory asset base, as rolled forward in the regulatory framework, will tend to align with the DORC estimate over time. An advantage of this feature is that the depreciation of the asset will be compensated for by the depreciation component of regulated revenues used to establish tariffs.

A key feature of the Commission's proposal in the *Draft Regulatory Principles,* and not fully shared by Agility's approach, is that the same methodology for depreciation is used in the DORC valuation and the regulatory framework.[41] It was in fact envisaged that the approach be applied to the regulatory asset base roll-forward for both new and old assets with older assets initially set at what might be considered fair value and the regulatory asset base set to approach the DORC over time. This would be achieved by adjusting the future depreciation profile and, if necessary, undo previous compensation for return of capital through negative depreciation. The Commission's application of the approach maintains consistency between return of capital assumed in the building block approach to establish tariffs and changes in the value of the regulatory capital base over time. It contrasts with the Agility proposal which asserts its approach should be considered independently of the way tariffs have been set in the past, and indeed, the proposed regulatory framework.

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[41] Agility states that, if the value of the initial capital base is set at DORC (using the Agility approach) it may be appropriate for the regulatory depreciation schedule and reference tariffs to be consistent with the price path and depreciation schedule inherent in the DORC calculation. However, according to Agility the rationale for consistency diminishes if the value of the initial capital base is set below DORC. Agility letter to the ACCC, 14 September 2000, p. 2.

This inconsistency creates a major impediment to the methodology as a mechanism for determining a DORC value that could be considered relevant for the purpose of setting an initial asset value. In fact, the Code itself would require such a value to be significantly modified. Sections 8.10(f) and 8.10(g) of the Code requires the regulator to take account of the treatment of depreciation which is implicitly or explicitly evident in tariffs that have been set in the past. Therefore, even if the applicant proposed a move to an Agility depreciation profile in its proposed access arrangement, it would not be appropriate to use the Agility DORC for the purpose of setting the initial capital base. This is because such a value would not recognise the payments users have already made to compensate the service provider for depreciation of its assets. This 'fairness' based proposition holds true even where the assets have not been previously regulated and the past depreciation needs to be imputed from the level of previous tariffs and any other evidence the regulator may have available.

The attraction of the Agility concept of DORC is that it does give a value which one might expect in a hypothetical contestable market. In using the concept as the basis for rolling forward the regulatory asset base the Commission perceived value in that the tariff profiles would be similar to those observed in a competitive market thereby avoiding price shocks and inter-temporal and inter-regional inconsistencies in pricing. However, the Commission has placed little emphasis on the relevance of the concept for deriving a relevant market value or setting an initial capital value for the MSP. This was partially for the reasons outlined above but also because of the artificial nature and questionable relevance of the assumptions used in the hypothetical competitive market proposed by Agility:

- Agility considered a hypothetical competitive market, however a competitive market is normally considered to set prices at marginal cost. In a natural monopoly industry such pricing would not cover the overall cost of service provision as implied by the Agility argument;
- even if a contestable market is considered, the analogy fails because of the 'sunk' nature of the asset investment; and
- the regulated sector to date has consistently argued that even the traditional approach to depreciation does not give fast enough return of capital to cover the write-down of assets for by-pass and redundancy risk. While the Commission has maintained that such levels of depreciation are probably adequate in the traditional model to reflect such risks, in the *Draft Regulatory Principles* it made modifications to its NPV based DORC approach to take explicit account of the impact of perceived risks of this type on asset values. There is no parallel mechanism in the Agility proposal. If such risks are an inherent aspect of the regulated businesses it does not make sense to suggest a natural depreciation fi-amework where depreciation is minimal over the main part of the life of the asset.

On balance, if the hypothetical contestable market is to be relevant for a regulated business, it must be one that shares key features of the natural monopoly industry it purports to model. In the gas industry, it is one where traditional straight line real

depreciation is the norm. This may be justified, either in terms of the natural risk structure, or indeed, attributed to the regulatory framework.[42]

The Commission does not consider Agility's proposed methodology for calculation of the DORC to be appropriate for regulated gas assets for two main reasons:

- it is inconsistent with the depreciation proposed in the regulatory framework and the historical treatment of depreciation for the purpose of setting tariffs and loses its relevance for setting an initial capital base which needs to comply with fairness requirements of the Code, (sections 8.10(f) and **(g)** in particular); and
- the hypothetical contestable model used to establish the revenue profiles of new and existing assets has limited relevance to the regulated gas pipeline industry.[43]

Establishment of the ORC valuation

EAPL has proposed that the ORC for the MSP is approximately $1 058 million. The Commission engaged the services of Kinhill Pty Ltd to undertake a desktop review of the optimised design and replacement costs contained in the Venton report. Following is a summary of Kinhill's findings:

- the optimised design of the MSP contained in the Venton report is reasonable;
- the replacement costs are reasonable, although on the high side of the historically achieved range of costs for Australian pipelines, but are valid in the current climate because of higher costs of managing land acquisition and approvals;
- the unit costs of the MSP contained in the Venton report range from $834 to $1 241/mm/km ($1 010/mm/km for the Moomba to Young section) compared with $500 to $1 000/mm/km for Australian pipelines overall;
- the higher cost pipelines in the Venton report appear to be those associated with a high proportion of rock trenching and off-take facilities;
- the high unit cost for the Moomba to Young section is the result of high land acquisition management costs and approval costs;
- it is reasonable for the optimised design to be based on a 15 year load forecast. Kinhill contrasts this with recent designs for NSW distribution systems based on five-year forecasts and notes that regular looping or incremental compression is more likely to occur on a distribution system than a transmission system; and

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[42] For example, the hypothetical contestable market could be viewed as an industry where the incumbent operator is required to regularly re-bid for its licence on the basis of what it is willing to pay for the assets which will be subjected to regulation. The previous incumbent receives the proceeds of the bidding process. The incumbent may retain the business by effectively bidding a higher price. The highest non-incumbent bid price would reflect the DORC value. In such a hypothetical market, the DORC value would continue to equate to the NPV of revenues anticipated over the remaining life of the existing assets. Correspondingly the derivation of the DORC from the ORC would be based simply on the NPV of revenues from existing assets relative to the NPV of revenues expected from an optimised replacement asset. Under this scenario the traditional approach to the calculation of DORC remains appropriate.

[43] An equally plausible hypothetical construct of a contestable market with sunk costs incorporating regulation of revenues paralleling the actual regulatory framework gives rise to a DORC supporting the traditional approach.

- the proposed asset lives are reasonable, including the 60 year life for the Moomba to Wilton section as opposed with 80 years for other sections of the pipeline system.

The Venton report states that the accuracy of the $1 058 million ORC estimate is in the range of plus or minus 20 per cent. In addition, included in Venton and Associates' ORC value is a ten per cent contingency factor amounting to **$82** million. If this component is omitted, the ORC value is $976.1 million. Although it may be appropriate for a business to include a contingency factor in its estimates of the projected costs of constructing a new pipeline, this is not the case when determining the regulatory value of the initial capital base of an existing pipeline. Table 2.2 shows the ORC values for each segment of the MSP with and without the contingency factor.

Table 2.2: MSP optimised replacement costs excluding ten per cent contingency factor

	Moomba to Wilton	Young to Lithgow	Young to Culcairn	Junee to Griffith	Dalton to Canberra	Total
EAPL	893.0	**50.4**	64.1	31.3	19.5	1 058.3
Venton	893.1	51.1	64.7	30.5	19.0	1058.2
less contingency	71.4	3.3	4.2	2.0	1.2	82.1
Adjusted ORC	821.6	47.8	60.5	28.5	17.8	976.1

Source: Supplementary access arrangement information, p. 12. Venton and Associates Pty Ltd, *Optimised Design and Cost Estimate EAPL Pipeline Network, 20* June 1999, Attachment 3.

Note: EAPL states that the ORC quoted in its supplementary access arrangement information differs slightly from figures quoted in the access arrangement information (p. 27) due to rounding.

The Commission undertook its own in-house assessment of the replacement costs of the MSP and proposes that ORC should be based on the Venton report, but reduced by the amount of the contingency factor, giving a value for ORC of $976.1 million. The Commission's proposed ORC values for the various asset categories are compared with EAPL's proposal in Table **2.3.** It was noted earlier that EAPL's proposed ORC for the MSP differed slightly from that proposed in the Venton report. Similarly, differences in the ORC values of some asset categories are also evident. **As** the Commission's assessment is based on the Venton report, some differences also occur between the Commission's proposed ORC and that proposed by EAPL. For example, the Commission has assessed the ORC for metering at *$20.5* million, in accordance with the Venton report, compared with $14.0 million proposed by EAPL.

Table 2.3: Comparison of ORC and DORC values ($ million)

	ORC	
	EAPL	**ACCC**
Pipelines - Moomba to Wilton	819.9	748.7
Pipelines - Young to Culcairn	59.4	57.7
Pipelines - laterals	90.8	81.3
Compressors	58.1	51.5
Metering	14.0	20.5
Plant, machinery, equipment	10.3	10.3
Mobile equipment	6.0	6.0
Total	**1 058.6**	**976.1**

Application of the traditional approach to DORC estimation

A particular issue for the MSP is the method of determining the value of DORC using the traditional approach when the modem equivalent replacement asset has a useful life different to that of the existing asset. For depreciation purposes EAPL has assumed an economic life of 60 years for the Moomba to Wilton segment of the pipeline and 80 years for other segments. **A** shorter life has been assumed by EAPL for the Moomba to Wilton section as it is out-dated technology (in terrns of the type of coating used) and because of deterioration due to stress corrosion cracking. Deterioration of a pipeline in this manner should reduce the value of that part of the system to a purchaser and the 1994 sale price ought to have reflected this.

The DORC for the Moomba to Wilton segment initially proposed by EAPL is based on a remaining life of 36 years for an asset with an original life of 60 years. This approach would be valid if the life of the existing asset is equivalent to the life of the replacement asset. However, if the replacement asset has a usefhl life in excess of the life of the asset being replaced, this approach would overstate the value of DORC.

An alternative approach involves adjusting the value of ORC downwards on a pro rata basis in accordance with the difference in useful lives between the replacement asset and the existing asset. In the case of the MSP the value of ORC would be reduced to 60/80 of the replacement costs. The adjusted ORC value would then be depreciated in accordance with the remaining life to determine the value of DORC.[44] This process can be simplified to one step by calculating DORC with reference to a useful life of 80 years (not 60 years) and a remaining life of 36 years, as shown below:

[44] This approach was advocated by Mr Rohan Zauner, Principal, Sinclair Knight Merz Pty Ltd, at the ACCC's conference on asset valuation, June 2000. Rohan Zauner, *Valuation Principles* and *Tariff Setting Framework,* June *2000,* p. 6.

EAPL's approach: DORC = ORC x 36/60 (DORC = 60% of ORC)

ACCC's approach: DORC = ORC x 60/80 × 36/60

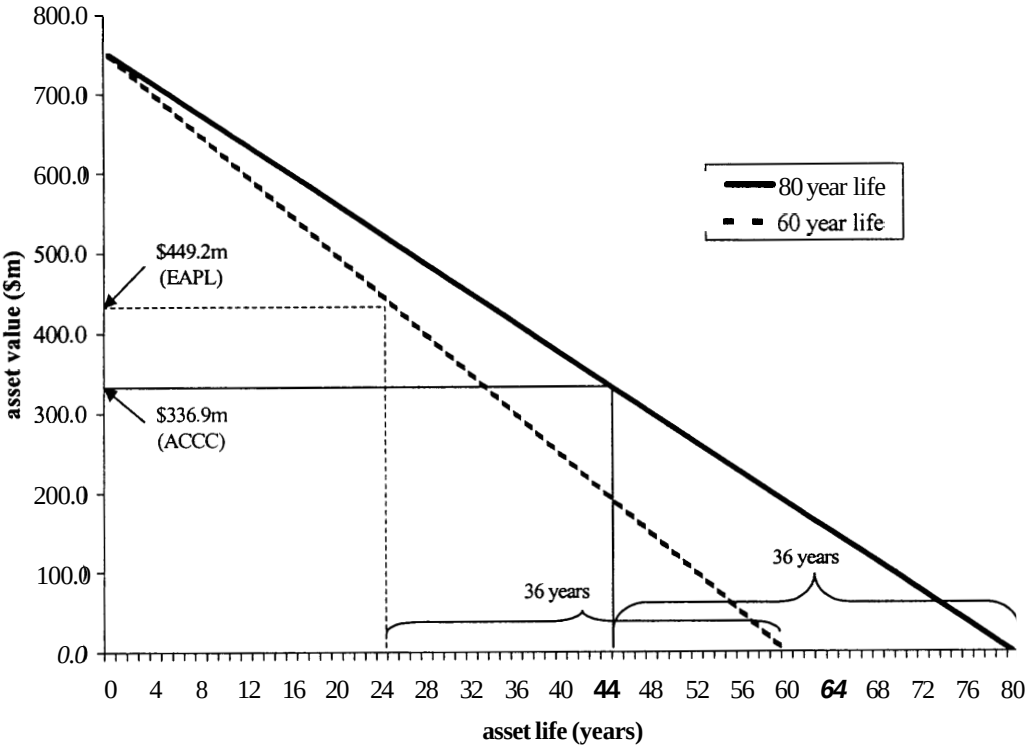
= ORC x 36/80 (DORC = 45% of ORC)

The Commission has estimated an ORC of $748.7 million for the Moomba to Wilton segment of the MSP under this approach. Using this as the starting point, the approach would result in a DORC of $336.9 million (compared with $449.2 million for the same segment using the approach proposed by EAPL). The Commission considers that DORC calculated in this manner is likely to result in a value for the capital base which is more representative of the value above which uneconomic by-pass would occur (or the price that **a** potential purchaser would pay for the MSP) than the methodology proposed by EAPL. These alternative DORC values are illustrated in Table 2.4 and Figure 2.1.

Table 2.4: DORC values when life of existing asset differs from that of replacement asset

	EAPL's approach	**ACCC approach**
Moomba to Wilton		
ORC ($m)	748.7	748.7
DORC ($m)	748.7 x 36/60	748.7 x 60/80 x 36/60
	= **449.2'")**	= **336.9**

Figure 2.1: Alternative DORC values for the Moomba to Wilton segment



After the adjustment is made to EAPL's proposed ORC as discussed above and DORC is adjusted to account for the difference in asset lives between existing and replacement assets, the value of DORC for the MSP, as a whole, would be **$499.9** million.

The DORC value of the Moomba to Wilton pipeline segment has been reduced relative to its ORC value in recognition that its anticipated remaining life would not give an overall life that would match the 80 years of the replacement asset on which the ORC value was based. However, if the pipeline was able to operate for the longer period it would have a correspondingly higher value. In its submission APT states that the life of the Moomba to Wilton section could be extended to 80 years through refurbishment (re-coating of the pipeline) in certain areas. This means that the normal DORC from ORC calculation could be used but the value would still overstate the DORC value of that pipeline segment because it would not recognise the extra cost of extending the life of the existing pipeline relative to a replacement pipeline using the latest technology. The NPV of these extra costs, which may include extra running and maintenance costs and refurbishment costs, needs to be subtracted. The correct DORC derivation in these circumstances is the normal DORC estimation net of the NPV of these extra costs that would not be incurred by the replacement pipeline. The refurbishment cost is estimated at $560 000 per km for 250 km between the years 2033 and 2056. Adoption of APT's proposal would have an impact on DORC and depreciation charges. DORC for the

Moomba to Wilton section should now be calculated as 56/80ths[45] (or **70** per cent) of ORC rather than 36/60ths (or 60 per cent) of ORC (net of the costs of refurbishment).

While APT has not calculated a revised figure for DORC, it can be deduced from the ORC and the refurbishment costs provided by APT. Based on EAPL's proposed ORC (and ignoring the costs of refurbishment for the moment) the new DORC for the Moomba to Wilton section would be **$573.9** million and **$748.0** million for the entire MSP (in contrast to the $666 million figure originally proposed by EAPL). However, these figures should be adjusted downwards for the NPV of the refurbishment costs. Based on APT's proposal, and assuming the refurbishment costs are spread evenly over the period **2033** to 2056, the Commission estimates the NPV of the refurbishment costs at approximately **$2.7** million. While the total cost of refurbishment is **$140** million, the **NPV** is low because the refurbishment is not forecast to commence until well into the future. Based on EAPL's proposed ORC and deducting the NPV of **$2.7** million results in a DORC for the entire MSP of **$745.2** million. Based on the Commission's proposed ORC, this approach would result in a revised DORC for the MSP of **$684.3** million.

Selecting the DORC methodology

The above discussion has highlighted that there is no unique DORC methodology, which can be used to unambiguously set the regulatory value in a way which is fair to both the service provider and users. This focuses attention on the intent of the Code as discussed previously. For a valuation methodology to give a value which is fair to both users and owners, account must be taken of the way depreciation has been used in the past as a basis for setting tariffs. The proposed future regulatory framework is essentially irrelevant to the DORC methodology. This is a robust conclusion easily demonstrated within the context of simplified regulatory models. In Appendix D, it is clear that a regulatory asset base reset midway through the life of the asset can be linked to a DORC valuation but that DORC valuation must use the same depreciation path applied to establish revenues and tariffs over the first half of the life of the asset.

In the case of the MSP, it would appear that the rate of depreciation assumed by the owners of the pipeline in the past exceeded that used in the calculations above by a significant margin. This appears to be related to the earlier assumptions that the pipeline had an expected economic life of 30 to 50 years. Calculating the DORC based on this assumption and using the standard the straight line depreciation methodology indicated in the owner's accounts gives DORC values well below those derived by assuming the MSP has an overall economic life of 80 years. The calculations are presented in Table 2.5.

[45] **56 years rather than *36* years is the remaining life of the asset under this scenario.**

Table 2.5: DORC values emerging from historic rates of depreciation to main pipeline assets ($ million), 1 July 2000

Assumed Life (years)	ORC	Notional accumulated straight line depreciation	DORC
60	976.1	372.4	603.7
50	976.1	438.0	538.1
40	976.1	536.3	439.8
30	976.1	700.3	275.8

Source: ACCC analysis.

Proceeding on the basis that historic tariffs have assumed a 50 year pipeline life, the DORC that would represent a fair value for the MSP would be $539.5 million. (including access arrangement costs of $1.4 million).

In accordance with the above analysis, Table **2.6** compares by asset type the values for ORC and DORC proposed by EAPL to those proposed by the Commission.

Table 2.6: Comparison of ORC and DORC values ($ million)

	ORC		DORC	
	EAPL	ACCC	EAPL	ACCC
Pipeline - Moomba to Wilton	819.9	748.7	491.9	389.3
Pipeline - Young to Culcairn	59.4	57.7	50.4	43.6
Pipelines - laterals	90.8	81.3	76.9	61.3
Compressors	58.1	51.5	32.9	29.2
Metering	14.0	20.5	4.7	6.8
Plant, machinery, equipment	10.3	10.3	4.8	4.8
Mobile equipment	6.0	6.0	3.0	3.0
Access arrangement costs			1.4	1.4
Total	**1058.6**	**976.1**	**666.0**	**539.5**

Relevance of DORC for previously unregulated assets

As noted earlier, there is no unique DORC valuation which unambiguously indicates what the value of the initial capital base should be. Nevertheless, a DORC based estimate of the value of assets to be regulated can be fair to owners in that it doesn't systematically impose a capital gain or loss. For the same reason it is also fair to users. The only requirement in calculating the DORC from ORC is that the depreciation methodology matches that used as the basis for developing the tariffs prior to the setting the asset valuation. The difficulty in applying the approach to assets that were not previously regulated is that it is not always clear what mechanism has been used to establish tariffs and what allowance for depreciation has been made. In some cases, the assets may have been owned and operated by **an** integrated enterprise that sold bundled

transport and gas services and it may not be clear what part of the price was designed to cover transport costs. Fortunately, in the case of the MSP historic revenues from the operation of the pipeline are known.

*Economic **depreciation***

However, historic revenues may not unambiguously identify what allowance has been made for depreciation since such revenues cover not just depreciation but also operations and maintenance costs, post-tax return on capital and tax compensation. Nevertheless, estimates for the other costs can be made on the basis of historic financial data, company accounts and technical features of the pipeline. An important element determining whether estimates are reasonable or not depends on what assumptions are made about the relevant return on capital (historic cost of capital). Generally available historic financial statistics can be used to derive what a normal commercial rate of return at that time would have been. An amount for depreciation can then been inferred from the residual element in the revenue estimate. Summing these estimates of depreciation over time and tracking their impact on the depreciated value of the asset base provide a method of obtaining the time path of the asset base on which the owner has been earning a return. Such estimates of depreciation and the asset value are sometimes referred to as 'economic depreciation' since it is the depreciation that is consistent with the cash flows of the business. This approach offers a way of calculating the asset value for a future regulatory framework that is fair to the owner and users alike in precisely the same way as basing the asset value reset on the DORC in a historically regulated framework.

A problem with this methodology is that the service provider may argue that the analysis has assumed the wrong rate of return. The service provider may suggest that as a natural monopoly it pursued a much higher than normal rate of return and that the residual depreciation incorporated in revenues was correspondingly less. However, the service provider would also note that retrospective regulation is inappropriate by assuming that the return on capital was at a normal rate in the past thereby reducing the current value of the assets that will be used to set future revenues. These are valid points and how they should be considered is a matter for judgment on the part of the regulator. The need for such judgment seems to be acknowledged as appropriate in the Code since in setting the initial capital base section 8.10(f) requires the regulator to consider:

> the way tariffs have been (or appear to have been) set in the past, the economic depreciation of the covered pipeline, and the historical returns to the service provider from the covered pipeline

In the case of the MSP assets it would appear that the book depreciation values were not fully reflected in tariffs in addition to a commercial rate of return. This is demonstrated in Table 2.7, which presents the economic depreciation analysis for the MSP from its commencement of operations until its sale at 30 June 1994. The assumed rate of return is based on the WACC parameters assessed to be appropriate for this access arrangement adjusted for differences in historic interest rates.[46] The residual value at 30 June 1994 from this analysis is $1 291 million, well above the 1994 sale

[46] For this purpose it is assumed that the historic risk profile of the company as reflected in its equity beta, and other WACC parameters such as gamma, debt margin were as assessed in the present access arrangement. In combination with historic interest rates this **is** sufficient to calculate historic estimates of the WACC.

price and the various DORC estimates.[47] This would suggest that, if one of the DORC values were applied to the regulatory asset value moving forward from that point in time, there would be a windfall benefit to users and a possible windfall loss to the service provider. However, since the DORC value remains above the purchase price of the assets by the current owner, it is the previous owner and not the present owner, which has effectively sustained the commercial loss.

Table 2.7: Economic value and commercial rates of return, 1976 to 1994 ($'000)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
WACC (%)	13.41%	12.96%	12.67%	14.13%	16.08%	18.67%	17.86%	16.64%	16.59%
Opening assets	226 936	256 122	283 163	311 800	337 573	373 105	446 398	496 261	552 622
Required return	30 441	33 204	35 888	44 070	54 295	69 674	79 744	82 598	91 702
Revenue	2 789	11 672	18 139	23 392	23 302	31 327	43 113	51 098	56 217
Capital exp.	146	2 130	7 739	1417	259	29 615	6 437	16 284	3 012
Operating exp	1388	3 379	3 149	3 678	4 280	5 331	6 795	8 577	9 544
Economic dep'n	-29 040	-24 911	-20 898	-24 356	-35 273	-43 678	-43 426	-40 077	-45 029
Closing assets	256 122	283 163	311 800	337 573	373 105	446 398	496 261	552 622	600 663
	1986	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**
WACC (%)	17.28%	17.51%	15.75%	17.00%	17.42%	15.50%	12.74%	11.14%	10.41%
Opening assets	600 663	648 311	720 785	808 800	883 386	988 207	1 079 478	1 151 012	1 221 530
Required return	103 819	113 545	113 552	137 528	153 921	153 212	137 569	128 269	127 210
Revenue	67778	74 100	76864	80880	88686	87074	91 003	94603	94 103
Capital exp.	511	17658	34584	647	18431	2 091	659	11 605	8 148
Operating exp	11 097	15370	16743	17291	21 154	23043	24309	25248	28476
Economic dep'n	-47 138	-54 815	-53 431	-73 939	-86 389	-89 181	-70 875	-58 914	-61 583
Closing assets	648 311	720 785	808 800	883 386	988 207	1 079 478	1 151 012	1 221 530	**1 291 262**

Source: ACCC derived from TPA's annual reports.

In this case, the relatively high residual value confirms that monopoly rents had not been achieved in operating the natural monopoly pipeline, at least until 1994. This may not be surprising given that the pipeline was originally Government owned and monopoly pricing would not have been considered in the national interest. Nevertheless, the result suggests further analysis would be appropriate for pipeline developments that have been sponsored by governments.

Prior government ownership and asset sales

If the economic depreciation approach provides a valid guide, an added complication arises with assets that are government owned or were previously govemment owned. The government-sponsored owners of such assets may not have sought a commercial rate of return. Instead they may have sought to cover what they considered to be the

[47] The Commission estimate for the economic depreciated residual as at 30 June **1994** of **$1 291m** indicates the value estimated by EAPL as at 30 June 2000 **of** $3.1 billion may be excessive. Nevertheless, the conclusion that a commercial return on the MSP has not been achieved over its life is remains.

ongoing costs and may not have attempted to fully recover the capital expenditure by seeking to recover depreciation in addition to the opportunity cost of the funds employed. The information available to the Commission indicates that this may have been the policy in the case of the MSP, which was operated by TPA and sustained operating losses from its comrnencement in 1976 to 1985:

> …the intention was that the Authority [TPA] should carry the volumes of gas nominated by AGL at tariffs calculated to cover the Authority's costs and enable it to achieve a break-even result over the thirty year term of the Agreement.[48] It was recognised that the combined effect of the large capital investment and the relatively small volumes that would be transported initially would result in extremely high tariffs in the early years if a break-even result was to apply from the outset. The basis of the Agreement was therefore that operating losses would be incurred by the Authority in the early years when gas throughput was low but those losses would be recouped, with interest, in later years when throughputs (sic) increased.[49]

This refers to the recovery of costs to the Government of operating the pipeline, which did not include a commercial return. Therefore, as indicated in the above analysis a commercial return remained unrecovered as at June 1994. Calculating the residual value of the MSP pipeline based on economic depreciation applying a normal commercial rate of return gives a value even above the current ORC valuation. The fact that very little allowance has been made for depreciation in the past suggests that the maximum valuation permitted under the Code (that is, DORC) should be used to set the initial capital base. This is a somewhat simplistic view that ignores the fact that the modest tariffs were set as part of Government policy and that the assets have subsequently been sold to private owners at a price of well below the residual economic valuation. The Code (section 8.10(j)) provides for such complexities by suggesting that when setting the initial capital base the regulator should also take into account:

> the price paid for any asset recently purchased by the service provider and the circumstances of that purchase.

The comments fi-om the TPA annual report noted above confirm that the low rate of return was deliberate Government policy designed to stimulate development of the natural gas industry in NSW. That is, the tariffs paid by users carried an implicit Government subsidy without which tariffs would have been somewhat higher. Therefore, to base an initial capital base on a residual asset value linked to historic revenues ignores the Government's deliberate contribution which is not reflected in revenue received. To ignore such a contribution is to under-estimate the implied historic depreciation of the assets and possibly deliver an unwarranted windfall gain to the present owners of such assets. Comparison with the privatisation sale price of the assets indicates the implied windfall gain available to the new owners. This raises the question of what status should be given to the privatisation sale price in setting the initial capital base.

This is not a straightforward issue since there may have been other considerations in the sale price determination such as the value of contracts that were in place. One approach would be to simply ignore the sale price and proceed with a residual economic asset value based on revenues augmented by the assessed Government subsidy. Since such subsidies were never explicit some uncertainty would remain. However, an alternative approach utilises the sale price to put a precise value on the amount of subsidy provided

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[48] The 1974 Haulage Agreement with AGL.
[49] The Pipeline Authority, 1985-86 Annual report, p. 12.

by the Government to develop the gas industry. If it were assumed the relevant tariff should be based on a commercial rate of return the residual economic value for the assets can be expected to be well above the sale price.[50] This difference in valuation can be interpreted correctly as the value of the subsidy provided by the Government in establishing the pipeline up to that point including losses associated with changing market expectations.[51]

If the initial capital base on privatisation is set above the sale price, the new owner gets a windfall gain by effectively appropriating some of the subsidy ostensibly intended for industry development. If the initial capital base on privatisation is less than the sale price the new owner suffers an immediate windfall loss. The fair value for the initial capital base, as far as the owner is concerned, is the sale price. Similarly, the sale price is the fair value from the public perspective since it achieves a use of public funds commensurate with the opportunity cost of those funds.

The conclusion for the regulator is fairly clear – the privatisation price of the assets in this case must be a fundamental lynchpin of any initial capital base assessment. The issue is no different from a new pipeline development partly funded by a Government grant. This may occur for a commercially marginal project that was considered to be in the public interest. In such a case, the Commission would normally allow the developer to earn a commercial return only on that proportion of assets for which it provided funding as this would allow the benefit of the subsidy to flow directly to users and assist industry development.[52] Otherwise the funds would represent a free gift to the owner, which would be inappropriate, and the higher regulated tariffs may prevent the perceived public benefit from being realised.

When is the sale price of regulated assets unhelpful for determining the initial capital base?

The analysis above raises the more general issue of asset sales in the private domain and their relevance to asset valuation for regulatory purposes. For example, in the case of the Victorian gas assets the sale price of the assets exceeded their corresponding regulatory asset values by a large margin. This does not necessarily imply that the initial capital base values determined by the ORG and the Commission were in error. The regulatory asset base at the time of the sales were already set in accordance with the Code. The explanation for the high sale price must lie elsewhere. For example the high prices bid probably reflects a combination of:

- the winner's curse (valuations by the winner erroneously biased upwards by more than other bidders);

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50 **A** private developer may have sought a rate **of** return well above the normal commercial rate to compensate for the greenfields nature of the development. However, in this case the Government has assumed all such development risk. The use **of** the normal commercial rate of return in the calculation provides an upper limit as to the social opportunity cost of the funds employed.

51 **A** negotiated price from the purchasers perspective should not exceed the NPV of expected future revenues. To the extent that these may have been compromised by by-pass threats, technological change and the like the value may be less than a DORC valuation. **If** this is the case then it is essentially the Government, as underwriter of the development which has taken the capital loss implicit in the sale price.

52 **A** similar situation arises where capital infrastructure has been partially funded by direct user contributions.

- the winner's costs of capital being substantially below that initially proposed by the regulator; and
- expectations of efficiency savings and benefits of the new owners getting a foothold into the Australian energy market.

Negotiations for the sale of the MSP took place well in advance of regulation and were not part of a competitive bidding process. In that case considerations were considerably different and the same sources of bias are not apparent. Instead, the sale price was more likely to be based on user contractual obligations that were negotiated as part of the sale process and the remaining market development potential of the pipeline. Given the strong role played by negotiation, the sale price was still influenced by policy considerations of industry development. For example, the Government's negotiating stance clearly did not seek a sale price consistent with obtaining an overall commercial return on its investment.

The contrast in the circumstances surrounding asset sales and different interpretations of sale prices suggest a great deal of caution is required in applying sale prices as a means of establishing asset values. The natural monopoly position of many of the operations means that contractual arrangements can be established to support a privatisation valuation above the DORC which is difficult to sustain over the longer term. In these cases the DORC upper limit in the Code provides a useful safety net valuation for those cases where the sale price valuation of the initial capital base would inadequately recognise the contribution to capital return already made by users. In general, the lesser of the DORC and the privatisation sale price would seem to offer the best basis for setting the initial capital base.

Relative timing of regulation and privatisation sale

The above discussion assumes that regulation and privatisation occur simultaneously. This will only sometimes be the case. For the MSP and the MAPS privatisation preceded regulation and in the case of the Victorian gas pipelines privatisation followed regulation.

Where regulation follows a privatisation sale, the above discussion is most pertinent and all the considerations discussed above apply. However, a two stage process is required; firstly to establish the valuation at the time of the sale – probably the sale price; and secondly, using that as the starting point to take account of additional capital expenditures and computing the economic depreciation of all assets that have taken place since then to obtain the residual asset value that can be used for the initial capital base. The Commission's calculations for the MSP using information from EAPL's statutory accounts starting with the sale price valuation at 30 June **1994** suggest an economic depreciated residual asset value at 30 June 2000 of **$442.8** million. This compares with the written down sale price based on book value at that date of **$459** million which suggests that, on the basis of this analysis, EAPL achieved a better than normal rate of return since purchasing the MSP. The parameters used in this analysis are shown in Table 2.8.

Table 2.8: Residual asset value based on economic depreciation, 30 June 2000

Parameter	Value
Assumed effective tax rate	7.0%
Risk free rate[(a)]	5.9 – 9.0%
Equity beta	1.16
Debt margin	1.20
Market risk premium	6.0%
Residual asset value ($m)	442.8

Note: (a) Range of rates of return on Commonwealth bonds, June 1994 to June 1999.

To use the residual economic value as the initial capital base in the regulatory framework moving forward would amount to retrospective regulation to force the internal rate of return achieved by EAPL to the benchmark normal rate of return. This would be inappropriate. Moreover, the returns to EAPL have depended on its long term contractual arrangements with AGL. Normally when setting reference tariffs the Commission would have little regard to existing contractual arrangements. That is, high returns from a user under an existing contract could not be used to reduce the revenue that is to be recovered from other users through reference tariffs. Similarly, low returns from one user could not justify higher tariffs to other users. It could be argued that such a principle could be applied to the revenue earned to date by EAPL under its contractual arrangements with AGL. In this case, when establishing the value of the initial capital base, the Commission would disregard any excessive returns received by EAPL. To do otherwise could be considered a form of retrospective regulation.

Nevertheless, some allowance for depreciation of the asset must be accounted for to arrive at a fair initial capital base value. One basis for this could be the residual asset value that would emerge if it were assumed the regulatory framework had been in place since 1 July 1994. This would involve assumptions about remaining lives at that point in time. One guide for this purpose is the depreciation assumed by EAPL itself in deriving its statutory accounts.[53] If this is done the $459 million book value would become the initial capital base for the regulatory framework commencing 1 July 2000. If a CCA regulatory framework had been in place the regulatory asset value this figure would need to be adjusted upwards for inflation over the period. This would take the initial capital base estimate at 30 June 2000 to $520.9 million. However, if depreciation were at a slower rate consistent with the 80 year life now proposed for the assets, the corresponding estimates after subtracting the $2.7 million estimated NPV of refurbishment costs would be $499.8 million without inflation adjustment and $567.6 million with inflation adjustment.[54]

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[53] This was based on an a remaining life for the assets of 32 years as at July 1994, or an overall life of 50 years for the main pipeline assets.

[54] To be consistent with the 80 year life depreciation, it is appropriate to adjust the written down value for the refurbishment costs which makes that 80 year life feasible.

As a consequence, the updated valuation based on the sale price ranges from $459 million to $567.6 million, depending on the depreciation assumptions since July 1994. The standard methodology DORC, assuming a 50 year economic life for the pipeline assets consistent with the historical treatment of depreciation to date, gives a value of $539.5 million, above, but broadly in line, with sale price considerations. This provides a strong basis for proceeding with this DORC based valuation as the initial capital base for the MSP access arrangement. Firstly, users are not disadvantaged since they will not be required to support a double-up on depreciation or repay past government subsidies. Secondly, the service provider is not disadvantaged since the valuation roughly reflects the funds it expended in purchasing the assets. Thirdly, the intended Government policy objectives are preserved since the value of the implied gas industry subsidies have not been transferred to any significant extent from one party to another. All elements of the Code appear to be satisfied, in particular the fairness related issues. Once again the DORC valuation has proved appropriate, but with the requirement that the depreciation of the ORC be strongly linked with historic depreciation, not only in methodology (for example, straight line), but also in terms of assumed economic life (that is, 50 years).

Tax related considerations

In assessing what is an appropriate commercial return for a service provider it is vital to take account of taxes that will have to be paid so that the post-tax return indicated by financial benchmarks is a reasonable expectation. Depreciation is recognised as a cost of business for taxation purposes and so has the effect of reducing taxable income in any year. However, depreciation for tax purposes follows a different path than that implied for tariff setting purposes. Prior to the Ralph tax reforms depreciation for tax purposes could be at an accelerated rate so that taxable income in the earlier years of an assets life could be readily reduced to zero.[55] It should be noted that tax legislation only permits an asset to be written off once so that the application of accelerated depreciation means there will be no tax depreciation available to reduce taxable income in later years and tax liabilities will represent a greater burden on cash flows at that time. As available tax depreciation is used, the post-tax value of future cash flows diminishes at a greater rate than the depreciating asset value. Hence, under a pre-tax framework, which provides for tax compensation by adding a constant 'wedge' to the permitted rate of return whose magnitude does not vary with the timing of tax payments, the market value of the asset will generally be below the regulatory asset value.

In a post-tax framework compensation for taxes is included in cash flows when they are expected to become due therefore the divergence of value does not occur. Because tax is compensated for in cash flows directly, any additional allowance for tax provided, for example through the application of a tax wedge, is excess to the required post-tax return required. It is essentially a costless source of cash flow. Since such funding is costless for the firm it must not earn the regulatory rate of return on the accumulation of such funds. Therefore, it is appropriate to interpret the tax-wedge allowance as a temporary return of capital or an augmentation of normal depreciation which serves to justify a reduction in the regulatory asset value. No further adjustment is necessary since the

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[55] **The scope and extent** of **accelerated depreciation will be more limited but not eliminated under the Ralph proposals.**

regulatory framework takes account of actual taxes when they become due. Normalisation is the adjustment to the depreciation profile in the post-tax framework to allow revenues to adjust gradually over time despite the fact that tax payments are concentrated towards the end of an asset's life.

In a pre-tax framework, the issue may be dealt with in exactly the same way. The tax wedge implicit in the pre-tax WACC generates a free source of funding which must be deducted from the asset base. Hence, again the normal depreciation is supplemented by the amount of the taxation allowance. What this means is that the regulatory asset value declines at a somewhat faster rate than expected for purely technical reasons.

Matters are more difficult to analyse outside of a regulatory framework where it is not clear what component of revenues represent compensation for tax. In essence, it is necessary to deduce the tax allowance that is implied in revenues. Fortunately, standard accounting practices provide the essential material for such calculations to be done. Statutory accounting requires the estimation of deferred income tax for corporate entities. This is the cumulative value of tax deferred as a result of tax depreciation deductions to income exceeding the (book) provision for depreciation in company accounts and other timing differences. The book depreciation is normally aligned with some assessment of economic depreciation and is therefore linked to what would be assumed in a regulatory framework.

As deferred tax results from the application of taxation depreciation it is a measure of the erosion of available tax depreciation allowances associated with the assets. At the same time, the business cash flows benefit from the amount of the tax that has been deferred. Thus, the deferred tax in any period is just like the allowance for tax in the pre-tax regulated framework and can be interpreted as a return of capital. For any regulatory framework that intends to compensate the owner for forecast taxes,[56] the accumulated value of deferred tax provides an estimate of the amount of extra depreciation that should be applied to a regulated asset value. In particular, it is a relevant additional adjustment to the technical depreciated cost in establishing the value of the initial capital base by a regulator. Since the deferred tax also reflects the wastage of an economic asset (namely, the tax depreciation base, which is a financial asset linked to the physical assets), such an adjustment is also warranted in the context of a DORC methodology.

This adjustment for usage of the tax depreciation will be appropriate to the initial capital base being introduced into any regulatory framework that is designed to compensate for future tax liabilities. In a pre-tax framework this may involve a higher tax wedge moving forward in recognition that tax liabilities will be due in a shorter time-frame. In addition, such a perspective on allowances in revenues for tax in excess of current requirements clearly identifies what adjustments are required in moving from a pre-tax framework to a post-tax framework. Any net pre-payment of taxes must be viewed as a return of capital and the cumulative value deducted from regulatory asset value at the start of the next review if this has not been done progressively as part of the previous access arrangement period.

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[56] **This is not only true of a post-tax regulatory framework but will also be true of a pre-tax regulatory framework where the effective tax rate or tax wedge has been based on forecast future tax liabilities.**

It may be claimed that such a change to the regulatory asset value amounts to retrospective rate-of-return regulation. This is not the case. All that has been done is to recognise the loss in value of the asset tax base for depreciation purposes and this will be fully compensated for by the allowance for future forecast taxes whether in a post-tax or pre-tax framework (in the latter case where the tax wedge is calculated on this basis). As for altering historic rates of return, this is more apparent than real. For example, the revenues giving rise to the deferred tax may include a substantial component of monopoly profit, but this has not been altered. If the profits had been less the deferred tax would also have been less. But in this case, the residual value of the tax asset base for depreciation or the carried forward tax loss in the regulatory accounts would be greater by a corresponding amount. Hence, the level of historic revenues does not influence future regulated revenues under this arrangement.

The only modification to the deferred tax adjustment that may be warranted is to take account of changes in the tax system which alter the value of the tax allowances to investors. For example, if the tax rate were forecast to increase it may be appropriate to proportionately increase the value of the deferred tax to reflect the greater value of the tax depreciation allowance now used up.[57] Similarly, if investors gain benefits from company tax expenses, such as imputation, the value of tax depreciation used is correspondingly reduced and this can be reflected in a smaller adjustment of the initial capital base.

Special tax concessions for privatised assets

Accelerated tax depreciation provisions that have been available until the introduction of the Ralph tax changes meant that for tax purposes most assets could be written off for tax purposes over a ten year period. For assets such as the MSP, this would mean that the remaining asset value for tax depreciation was negligible. However, in the case of the MSP, the tax status of the assets was established as part of the sales agreement with the sale price forming the basis for tax depreciation deductions. Under Division 10AAA of the Income Tax Assessment Act the principal asset of the MSP could be written off over ten years. EAPL's statutory accounts confirm that it has chosen to invoke this option. Consequently, EAPL has claimed seven years depreciation of the MSP assets to 30 June 2000. This leaves a residual value of just 30 per cent of the sale price value to be utilised in reducing future tax liabilities. This could be used to assess the reduction in the asset value due to erosion of the tax shield. In the context of the post-tax framework, the loss in value is the utilisation of value to reduce taxes adjusted for depreciation and the future tax rate. Interpreted as a free source of capital the amount would be $133.9 million. However, this does not take account of depreciation on new capital expenditure since 1994. More significantly, it overstates the return of capital because not all the accelerated depreciation already claimed as a deduction has been utilised to defer tax liabilities.

The remainder of the already-claimed tax depreciation is reflected in carried forward tax losses. Since the timing of benefits of depreciation concessions embodied in carried forward tax losses is uncertain, it is better to work with the value of taxation deferred to date and incorporate the carried forward tax loss as part of the cash flow analysis. This

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[57] **Under the Ralph tax reforms the corporate tax rate is forecast to reduce so the deferred tax adjustment will, in fact, be less than the accumulated deferred tax.**

means the free source of capital equates with the accumulated deferred tax liability in EAPL's statutory accounts. However, in deferring tax liabilities the investors are also deferring imputation credits that accompany the payment of tax. Hence the accumulated value of the deferred tax must be reduced to allow for the potential imputation credits foregone. With an imputation rate assumption of 50 per cent this reduces the amount by half. While this represents the free source of capital it does not reflect the potential increase in future tax liabilities, because under the New Tax System the corporate tax rate is reduced from *36* to 30 per cent. By making both these adjustments the net value reduction in the value of the asset due to the utilisation of available tax depreciation is $37.4 million.

International best practice and competitiveness of energy consuming industries

In assessing the value of the initial capital base the Commission is required to consider the international best practice of pipelines in comparable situations and the impact on the international competitiveness of energy consuming industries. Incitec draws on the North American experience to support the case for DAC. It states:

> …under a **DAC** regulatory environment, there is still a dramatic growth in Canadian Pipelines.. ., this voids the argument that only DORC can encourage pipeline growth.[58]

It is important to note that the Code distinguishes between existing and new investment with regard to the value of the asset base. DORC is only relevant to the establishment of the value of the initial capital base of existing covered pipelines. Capital expenditure with respect to new covered pipelines, and new investment on existing covered pipelines, is added to the capital base at actual cost. Comparisons with ongoing investment in overseas jurisdictions have little relevance to the establishment of the initial capital base for existing pipelines covered by the Code. It is the rate of return and incentive mechanisms, and not the valuation methodology of the initial capital base, which are more likely to be the main determinants of future investment.

Clearly the international competitiveness of domestic industries is enhanced by having input costs, such as gas transportation, as low as possible. As capital costs form the bulk of gas transportation tariffs, it follows that the lower the value of the initial capital base the lower will be tariffs to end users. This argument tends to support an asset valuation based on the lower end of the feasible range of asset valuations, that is DAC. However, the international competitiveness of energy consuming industries is only one of several factors that the regulator is obliged to take into account in establishing the value of the initial capital base. These factors are intended to strike a balance between the interests of the service provider and users.

Economically efficient utilisation of gas resources

This provision requires the Commission to have regard to a valuation methodology consistent with providing price signals that result in incentives for the efficient development and use of gas resources. This can be achieved by setting tariffs which reflect the true costs of gas transmission services. As mentioned earlier, economic principles do not provide clear guidance on the valuation of sunk assets from the

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[58] Incitec submission, 18 August **1999,** p. 1.

perspective of economic efficiency. Hence, a feasible range of asset values is permitted under the Code.

However, economic principles do suggest that, irrespective of the valuation assigned to sunk costs, these costs should be recovered in a manner that distorts the behaviour of system users and operators as little as possible. In this regard the methodology used to allocate costs to services and users is perhaps of more relevance than the overall valuation of the initial capital base. The subject of cost allocation is considered later in this ***Draft Decision*** in section 2.9.

Reasonable expectations

The Code requires the regulator to take into account the reasonable expectations of persons under the regulatory regime that applied to the pipeline prior to the commencement of the Code. Since EAPL's purchase of the MSP in 1994, a third party access regime has operated under the provisions of the MSPSS Act.

Underpinning EAPL's purchase price of the MSP were the cash flows generated by the GTA, (recently replaced by the GTD). Contained in the GTA was an escalating tariff path for the duration of the agreement. EAPL has stated that the NPV of the cash flows inherent in its current long term contractual arrangements would yield an asset valuation in excess of the upper limit of DORC imposed by the Code. Accordingly, it may seem reasonable for EAPL to expect that the value of the initial capital base would be equivalent to DORC rather than to some lower valuation.

The Commission also considers that the reasonable expectations requirement of the Code suggests that unreasonable 'shocks' to both the service provider and users should be avoided. EAPL argues that a valuation less than DORC will result in an unjustifiable shock to EAPL. Since the projected revenue stream implied by a DORC valuation is substantially less than currently earned by EAPL, by implication revenue shocks to EAPL will be minimised by valuing the initial capital base at DORC.

One of the proposals in EAPL's access arrangement is the segregation of the MSP into mainlines and laterals for tariff-setting purposes. To date common rates of tariff have applied to the various pipeline segments. **As** a result of EAPL's proposed policy the tariffs applicable to the laterals of the MSP will be significantly higher than the mainline tariffs. The Commission considers it essential that service providers be able to recover efficient costs and achieve a commercial return on these assets so that there are incentives to invest in regional infrastructure. Only limited price shocks would occur under the proposals in this ***Draft Decision.***

Comparability with Eastern Gas Pipeline

As mentioned earlier, one of the Code's requirements is the comparability with the cost structure of new pipelines that may compete with the pipeline in question (section 8.10(i)). Of relevance to the MSP is DEIEGP's recently commissioned transmission pipeline (the EGP) from Longford to Sydney.

The capital cost of the EGP is understood to be in the vicinity of $450 million. However, for the purpose of determining **an** appropriate asset value for the MSP, it is difficult to compare the costs of the EGP with the costs of the MSP. The EGP does not

duplicate the MSP (the gas supply for each pipeline is sourced from different basins and the EGP does not supply as many regions as the MSP), the pipelines have different dimensions (EGP has a diameter of 457 mm while the MSP is 600 mm in diameter from Moomba to Sydney), and have different capacities.

Nevertheless, construction of the EGP raises issues for the Commission in its assessment of EAPL's proposed access arrangement, particularly as EAPL has forecast a loss of market share to EGP. The Commission has considered possible options for dealing with loss of volumes to a new entrant. They include adopting a non-linear depreciation schedule (refer to section 2.4), basing tariffs on defined capacity, or deeming volumes at levels prior to the loss of market share (refer to section 2.8).

Conclusion

The fair value for the initial capital base consistent with the Code can be assessed on the basis of historic information.

For assets that have always been privately owned, the DORC value is likely to represent a fair value for both users and the owners. However, it is important that in moving from the ORC to DORC the methodology should be reflective of pricing practices adopted by the owner. In general, this may require that the depreciation rate or assumed life of the assets adopted in the calculation of DORC be different to that proposed in the access arrangement for depreciating the capital base over the remaining life of the asset. The life assumption should reflect anticipated economic life and accelerated write-off of assets recognising by-pass possibilities, technological change, resource life or contract life, and perhaps, the erosion of the financial value associated with the tax depreciation value of the asset. If the DORC estimation methodology has not sought to capture the impact of the wasting of the tax value of the asset this may be done subsequent to the DORC estimate using the accumulated deferred tax approach.

Calculation of the residual economic value based on economic depreciation implied by historic revenues and costs offers a valuable check. However, where the DORC exceeds this residual it can be concluded that the owner may have achieved some monopoly rents. Retrospective regulation is not contemplated, and the initial capital base would normally be based on the DORC. However, such a result suggests that the asset life, technological change and valuation assumptions should be closely re-examined.

If the reverse is true and the residual economic value exceeds the DORC, such an approach may imply windfall losses for the owner. Nevertheless, the Code still requires application of the DORC as the maximum value of the initial capital base. Such situations to date have only arisen in the case of Government owned assets where the outcome can be attributed to an implicit Government subsidy, which is not reflected in the residual economic value. This interpretation suggests that the Government sale price may be a fair and reasonable value for the initial capital base for regulatory purposes. This valuation would reflect the Government's intended contribution to industry development and public benefit, and avoid unintended windfall gains and losses to the private purchaser of the assets. However, if there is a delay in introducing such assets to the regulatory framework there needs to be an updating of the asset value reflecting capital expenditure, depreciation commensurate with **any** changes in pricing policy and the changing tax status of the asset.

Where a Government owned asset has not been sold at the time of regulation, the DORC value, with the depreciation methodology based on standard industry pricing practice, can be used to provide an alternative to the residual economic value for the initial capital base. The residual economic value would only be preferred over the DORC for the initial capital base under the Code guidelines if it was less than the DORC and there was no reason to believe that the Government's cost of capital was greater than that indicated by the CAPM benchmarks. Under these circumstances it would be clear that users had paid for the greater return of capital implied by the residual value.

In the case of the MSP either the sale price or DORC could be considered a reasonable basis for establishing the value of the initial capital base. On the basis of the sale price the initial capital base valuation is $459 million (estimated book value at 30 June 2000) before the adjustment for deferred taxes. The DORC value calculated by EAPL is $666 million, but this estimate assumed asset lives well in excess of those contemplated by TPA and indeed by EAPL itself when it established third party tariffs following its purchase of the pipeline. Using this (an asset life of 50 years) as a more appropriate depreciation benchmark the DORC value reduces to a number consistent with the residual value.

Accordingly, the Commission is proposing that the value of DORC for the MSP should be set at $539.1 million. When the value of the deferred tax liabilities accumulated to date is removed, the value of the initial capital base is approximately $502.1 million, which is the value proposed by the Commission.

Proposed amendment A2.1

> In order for EAPL's access arrangement for the MSP to be approved, the value of the initial capital base is to be set at $502.081 million.

2.3 New facilities investment and capital redundancy

2.3.1 Code requirements

Once the value of the initial capital base is established, the capital base for each subsequent period is determined as the value of the capital base at the start of the preceding period plus new facilities investment (or recoverable portion), less depreciation and redundant capital (section 8.9 of the Code).

This leads to the issues of how capital expenditure and capital redundancies are treated under an access arrangement. This is the subject of this section.

New facilities investment

The Code (sections 8.15-8.16) allows for the capital base to be increased to recognise additional capital costs incurred in constructing new facilities for the purpose of providing services. The amount of the increase is the actual capital cost provided that the investment is prudent in terms of efficiency, in accordance with accepted good

industry practice and is designed to achieve the lowest sustainable cost of delivering services.

Furthermore, if the incremental revenue is not expected to exceed the cost of the investment, the service provider (and/or users) must satisfy the relevant regulator that the new facility has system wide benefits (justifying higher tariffs for all users), or that the new facility is necessary to maintain the safety, integrity or contracted capacity of services.

Under sections 8.18 and 8.19 of the Code a service provider may also undertake new facilities investment if these criteria are not met. To the extent that an investment does not meet the section 8.16 criteria or is speculative in character the augmentation of the capital base needs to be correspondingly reduced.[59]

Reference tariffs may be determined on the basis of forecast investment during the access arrangement period provided that such investment is reasonably expected to pass the requirements noted above when the investment is forecast to occur (section 8.20 of the Code). However, the inclusion of forecasts does not imply that the criteria contained in section 8.16 of the Code have been satisfied. The relevant regulator may reserve its judgment until the time that the investment is undertaken or at the next review of the access arrangement. The Code (section 8.22) also notes that the reference tariff policy should specify how discrepancies between forecast and actual investment are to be reflected in the capital base at the commencement of the next access arrangement period (so as to meet the objectives of section 8.1 of the Code). The alternative is for the regulator to determine how the expenditure will be treated for the purpose of section 8.9 at the time a revision to the access arrangement is submitted to the regulator.

Capital redundancy

Section 8.27 of the Code allows a reference tariff policy to include (and the regulator may require that it include) a mechanism that will remove redundant capital from the capital base. Such an adjustment would occur at the commencement of the next access arrangement period in order to:

- ensure that assets which cease to contribute to the delivery of services are not reflected in the capital base; and
- share costs associated with a decline in sales volume between the service provider and users.

Before approving such a mechanism, the regulator must consider the potential uncertainty and its effect on the service provider, users and prospective users.

Where redundant assets subsequently contribute to or enhance the provision of services, the Code (section 8.28) allows the assets to be added back to the capital base (including an allowance for a rate of return on the value of the redundant capital compounded from the time the redundant capital was removed from the asset base) as if they were new facilities investment subject to the associated criteria noted above.

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[59] That part of the investment which is of a speculative nature is held in the speculative investment fund and may be added to the asset base at a later date when it meets the criteria of section 8.16.