

Review of the Gas Code

Response to Productivity Commission's Draft Report

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Executive Summary

BHP Billiton is concerned that the Productivity Commission (PC) is un-necessarily seeking to fix a problem that it has provided no evidence actually exists; namely, that the National Gas Code (the Code) is distorting or otherwise impeding pipeline investment. Its main draft recommendations are un-necessary, potentially costly and unworkable. They favour pipeline investors over the balanced approach inherent in the Code as it is currently drafted. The PC's approach if adopted, would raise the risk of a long term increase in delivered gas prices above those of an efficient supply chain.

The objectivity and analytical rigour applied by the Productivity Commission (PC) in the past has not been carried through in the current Review of the Code. The PC's Draft Report is based on a series of misconceptions, is devoid of evidence and empirical analysis, and recommends fundamental changes that would weaken the Code and would defeat its stated purpose of promoting efficiency in the Natural Gas Supply industry.

It is difficult to understand the PC's approach given that the Australian industry is so much less developed than the US Natural Gas Supply industry. In the US where all pipeline services are subject to price caps and no applicant has met the competition test required in order to be allowed to independently set market prices.

The PC concentrates on pipeline investment to the exclusion of upstream and downstream issues

The PC's recommendations represent a significant change of direction for the Code, from being focused on promoting open access to pipeline services and preventing the abuse of market power, to promoting "efficiency" and investment in pipelines and distribution networks. The PC asserts that investment in pipelines has been distorted and curtailed, without providing any evidence in support. The PC's recommended changes focusing only on pipelines have the potential to cause distortions in other segments of the supply chain. For example, the fact that upstream investment in gas exploration might be distorted by a pipeline's monopoly pricing is not considered. Neither are the potential distortions resulting from vertical integration of pipeline ownership and domestic customer gas retailing, which is becoming increasingly evident in eastern Australia.

The benefits and costs of regulation are already considered by the NCC under the current Code

The PC assumes that the cost of regulation is high, but provides no evidence to support this assertion. In fact, the current regulatory framework requires the National Competition Council (NCC) under its public interest test (criterion (d)), to assess whether the cost of regulation and its effects will outweigh the benefits when it considers applications for coverage and revocation of coverage. Thus, small and isolated markets are exempted from coverage on the basis of cost/benefit. Rejecting the NCC's ability to protect the public interest under the current Code, the PC assumes that by instructing the NCC to determine a more complex two-tiered coverage test of "substantial" vs. "material" increases in competition, economic efficiency will be served. BHP Billiton rejects this suggestion.

The growth of gas customers, pipelines and superior market performance of pipeline companies is strong evidence the Code is working, but the PC has provided no case studies or cost/benefit analyses demonstrating it is not working

The PC appears to reject all evidence that the Code is working. Despite repeated accusations that regulation has stifled investment:

- pipeline and gas distribution network investment has been strong;
- over a million new gas customers have been added in the past decade; and,
- gas pipeline companies have out-performed the ASX Index as investments.

The PC charges that the "counterfactual" of no Gas Code has not been demonstrated, but the PC has not itself demonstrated or analysed the "counterfactual" of no regulation. This is what the NCC has done at each coverage/revocation hearing. Yet the PC has examined none of these cases to show that the public interest may have been better served with another result, such as "monitoring." In particular, the PC has not demonstrated with case studies how the public interest would have been served by requiring the "substantial" and "material" tests to be applied.

The PC's assumption that the industry is on the crest of "emerging competition" is totally flawed, as the major demand centres will be subject to significant pipeline market power for many decades

On the one hand the PC does not accept that the Code has assisted the development of the industry. On the other hand, the PC holds that growth in pipelines has been so strong that there is now "emerging competition" in the pipeline services segment. In fact, the Australian gas transportation market is highly immature compared with

the more than 130 pipeline companies in the US market, where maximum price caps are applied. The US regulator, FERC, allows companies to apply for exemption from the price cap subject to meeting a competition test centred on the Herfindahl-Hirschman Index (HHI) of market concentration. Based on a cut-off score of 1,800 and above indicating significant market power, no applicant in the US has had the transmission price cap removed. In Australia all the major capital city markets are in the range of 5,000 to 10,000 (the maximum, indicating pure monopoly) on a generous interpretation of this scale.

In the Sydney/Canberra markets, given forecast growth in gas demand, even under the most optimistic (and highly unlikely) scenario regarding entry of new competitors, the HHI would not reach 1,800 (the FERC cut-off) for at least 40 years. In most other major Australian markets it will take much longer than that.

Legal opinion has branded the PC's suggested "two-tiered" test potentially costly and unworkable

The PC's main policy prescription is to introduce a two-tiered framework attempting to differentiate situations of "substantial" from "material" improvements in competition, institute a monitoring regime in the latter cases and weakened direct regulation in the former. It is instructive to note that a leading law firm, Allens Arthur Robinson (AAR) has, on the public record, predicted that uncertainty created by the new tests has the potential to lock up the NCC in a series of appeals and reviews. Contrary to the stated objectives, this is likely to increase the cost of regulation and hinder investment in the industry. AAR also appears to concur with the Australian Government Solicitor that "substantial" and "material" "may indeed mean the same thing." In practice, it is highly likely that the proposed monitoring regime would not be capable of discerning the abuse of monopoly power unless a full analysis of pipeline costs is undertaken, as is the case currently. The risk of increased tariffs under a monitoring regime is real. Recently the ACCC has reported that airport charges have increased 63% since a monitoring regime was introduced.

A streamlined "objects clause" could assist, but the proposed dismantling of regulatory oversight is unwarranted

BHP Billiton agrees with the concept of simplifying the "objectives clause" of the Code, but not with the specific wording of the PC's Draft. BHP Billiton suggests the following wording:

To promote the economically efficient use of the services of transmission pipelines and distribution networks, thereby promoting competition in upstream and downstream markets.

However, the PC's radical proposal to dismantle full regulatory oversight, where the benefits have already been judged to exceed the costs by an independent authority, the NCC, could impose unforeseen costs that deter, rather than attract, investment into the industry and raise the long term price of gas to consumers.

The PC's proposed restructure of the access principles clause (Section 8.1) is superfluous, inconsistent and largely unnecessary

The PC's proposal is to restrict the discretion of the regulator in balancing investor and customer interests by making inappropriate adjustments to Section 8.1 of the Code. The suggested substitute words "at least" are superfluous and inconsistent with the uncertainty facing even regulated companies. Utilities should be provided with the opportunity to cover efficient costs, as well as the opportunity to earn more through superior efficient operations. These principles are already incorporated in the current section 8.1 of the Code.

The PC's recommendation 7.1 yields undesirable flexibility to vertically integrated operations and is at odds with the existing Code's sections 8.34-8.44.

BHP Billiton is concerned that the specific implications of the PC's proposed Access Principles for sections 2.24 and 8.2-8.49 of the Code are not spelled out. BHP Billiton is opposed to any substantive changes to any of these sections.

Chapter One

Overview of the Productivity Commission's Draft Report

1.1 The Productivity Commission's rhetoric substitutes for analytical rigour

The Productivity Commission (and its forebears) played a historic role in Australia's economic development through the application of independence and analytical rigour in its analysis. Given this tradition, the Productivity Commission's (PC) Draft Report on its Review of the National Gas Code (the Draft Report) is highly disappointing.

Far from undertaking a rigorous analysis of actual behaviour in the industry, the PC's Draft Report is lacking data, cost/benefit analysis and case studies demonstrating any of its highly contentious assumptions that lead to inappropriate policy recommendations. Furthermore, the PC Report is, in parts, charged with emotive language that is inappropriate in a professional review of an important regulatory framework. It appears therefore that the PC Draft Report is informed by an uncritical acceptance of the views put by the vested interests of pipeline owners and operators.

This response to the PC's Draft Report follows the detailed and wide-ranging Initial Submission that BHP Billiton provided in September 2003.¹ In this document, BHP Billiton wishes to concentrate attention on a few of the key issues and recommendations of the Draft Report and outline our response.

1.2 The Productivity Commission's assumptions are without foundation

A distinguishing feature of the PC's Draft Report is the failure to furnish any evidence, analysis or examples that would substantiate any of its key assumptions. The main assumptions outlined in the Draft Report are as follows:

The cost of regulation is high – the PC provides no evidence that the cost of regulation is high. More importantly, the PC undertakes no cost-benefit analysis to demonstrate that the marginal cost of regulation exceeds the marginal benefit that is provided. This is a fundamental tenet of economic analysis, and one that underpins the current regulatory framework, since criterion (d), the public benefit test applied to coverage decisions by the National Competition Council (NCC) undertakes a cost-benefit analysis in determining whether to recommend coverage of a pipeline or distribution network.

¹ See BHP Billiton (2003), *BHP Billiton Initial Submission to the Productivity Commission: Review of the National Gas Code*.

The Gas Code is not working – the Draft Report asserts that the Gas Code is not working in its present form. No evidence is presented to justify this assumption, although it is charged that the “counterfactual”, or situation that would have arisen without the Code, is not observable. However, the counterfactual is observable in a number of places including pricing on the Moomba Sydney pipeline, Airport price rises and in recent price behaviour of some pipelines transmitting gas to the Californian region of the US during the electricity crisis there.

Regulation deters and distorts investment – the PC’s analysis focuses inordinately on the potential deferral or distortion of investment in the pipeline component of the gas supply chain. It is a theoretical discussion, which itself is based on inappropriate assumptions. The fact that higher pipeline prices could distort upstream investment by gas producers and downstream investment by retailers and end users receives scant attention. The fact that investment in pipeline and distribution infrastructure in Australia has been marked by success, is deferred to the ‘counterfactual’ argument.

Foundation contracts will constrain prices – the overarching assumption of the Draft Report is that foundation contract prices will constrain prices. This assumption is incorrect. Foundation prices may reflect the outcome of negotiations reflecting features of “bilateral monopoly power”, but they do so under conditions of high risk facing shippers and pipeline owners. They do not necessarily reflect the outcome that would occur if the shippers could negotiate with a number of alternative pipelines. In other words, they do not necessarily mimic the outcome of effective competition. Furthermore, this approach does not take account of the position of subsequent shippers and the situation arising after the expiry of foundation contracts. It is this situation that exists on many Australian transmission pipelines and all its major distribution networks.

Effective competition is evolving – the PC Draft Report’s idea that effective competition is “evolving” is highly premature given the geographic structure of the Australian gas industry. The Australian pipeline transportation segment is still immature and non-competitive compared with, for example, the US industry. The major structural defect in the Australian gas pipeline industry is *the lack of competitive pipelines, which provide an alternative transport option for gas from the same source of gas supply to the same major market.*

1.3 The Productivity Commission’s prescriptions on the key issues are misguided

Productivity Commission’s prescriptions

Based on inappropriate assumptions, the PC Draft Report prescribes partial dismantling and weakening of regulatory oversight of the monopoly elements of the pipeline industry. The main PC recommendations are as follows:

“Efficiency” as an overarching objects clause – the PC Draft Report recommends that the current objects clause of the Code be amended to give primacy to a single objective of “efficiency”.

“Substantial” increase in competition - regulation of tariffs is recommended by the PC only in the event of a ‘substantial’ increase in competition in upstream or downstream activities. It is recommended that the discretion available to regulators in regulating pipelines and distribution networks be reduced.

“Material” increase in competition – the PC Draft Report recommends a “light handed” regime of monitoring prices if only a ‘material’ increase in competition would result from the related market. This threshold for monitoring is expected to be higher than the current threshold.

1.4 The Productivity Commission’s prescriptions on secondary issues may have some merit.

Some of the PC’s draft recommendations on secondary issues appear to have merit although as with the key draft recommendations they are not demonstrated to have merit via rigorous analysis of the facts. Specifically BHP Billiton believes that draft Recommendations 7.2, 11.1, 11.2 , 11.3, 11.4, 11.6 & 12.1 appear to be sensible administrative amendments that would enhance the Code and streamline its implementation.

1.5 Conclusion

The PC’s Draft Report reveals a preference for the views of the segment of the industry that has the least potential for effective competition. This response, which follows a very detailed Initial Submission by BHP Billiton, focuses on a small number of key issues, and will show that the PC’s Draft is based on flawed assumptions and proposes radical revisions to a regulatory framework that has served well the interests of investors and gas customers alike.

Chapter Two

Why Cost-Based Access Regulation is Needed

2.1 Characteristics of market power

Contestable markets

Contestable markets theory² proposes that in a perfectly contestable market, the following conditions are required for incumbent firms to be threatened with potential competition:

- a) Zero barriers to entry;
- b) Costless market exit (all entry costs are fully recoverable); and,
- c) The entry lag is less than the time required for the incumbent firms to adjust prices.

The gas pipeline industry does not exhibit these stylised conditions, so that natural monopoly conditions may be present at various points in the transportation chain. Strictly speaking, a natural monopoly exists if over the relevant range of output the costs are “subadditive”. This means that it is cheaper to produce the output by a single firm than dividing the output among two firms. However, market power will also distort pricing, investment and consumption decisions in oligopoly situations.

Market power in the gas pipeline industry

In the US, the Federal Energy Regulatory Commission (FERC) defines market power as “the ability to profitably increase prices above costs without attracting entry to the market”. This is a practical definition of market power, which relies on an assessment of the potential for anti-competitive behaviour. In such cases it is appropriate to apply pipeline access price regulation as long as the marginal benefit of regulation is greater than the marginal cost to society.

² Baumol, William, J., Panzar, John, C. and Willig, Robert D. (1988), *Contestable Markets and the Theory of Industrial Structure*, Revised Edition, San Diego, Harcourt Brace Jovanovich.

The key to pipeline competition is alternative pipelines from the same gas source

The main factors affecting competition in the gas supply industry are:

- a) Elasticity of demand;
- b) The price of alternative energy sources, such as electricity, which will exert an influence on gas prices; and,
- c) The existence of alternative sellers and supplies of gas, whether from the same or alternative gas sources.

The market characteristics of gas producers in Eastern Australia are as follows:

- a) By the end of 2004 four large gas production joint ventures, a significant number of smaller gas production joint ventures, and a significant number of potential new entrants that the industry expects to be in production by 2008;
- b) Relatively low barriers to entry;
- c) Relatively low economies of scale;³
- d) Sunk costs;
- e) Few alternative transport opportunities to major markets.

The key differentiating feature of the gas exploration and supply industry is that while it is more concentrated in Australia than in the US, the incentive for investment depends on the price of gas. If wellhead gas prices were to rise due to the exercise of market power, this would attract entry into the gas supply sector, which does not need to be at a high scale relative to the size of the market. New entry has had the effect of expanding supply and setting gas prices to competitive levels.

The typical characteristics of Australian gas pipelines are:

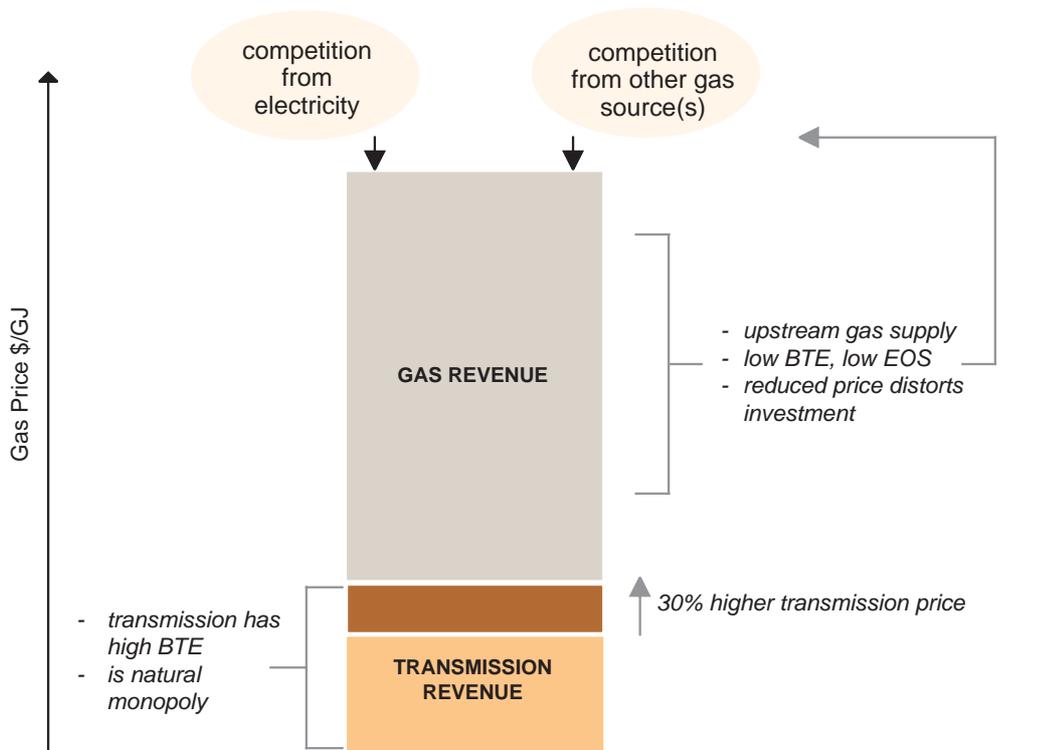
- a) Monopoly (no direct, or parallel, pipeline competitors) or at best, duopoly;
- b) High barriers to entry;
- c) High economies of scale relative to size of market;
- d) High sunk costs.

The key to the market power of pipelines in Australia is the lack of parallel pipeline competition. In the presence of sunk costs, given the pressures of alternative energy sources and competing sellers, the gas price at the market will be determined by market forces. However, the distribution of revenue between the shippers and the pipeline will depend on the market power of the pipeline relative to shippers. If there is no competing pipeline from the source of gas supplies, there will be no alternative for the shippers (whether gas producers, retailers or end users) but to absorb higher transport costs. This situation is shown in Figure 2.1 below.

³ In a recent report commissioned by the Australian Gas Association, ABARE noted that it is “clear that gas production can occur on a very small scale, especially where there is an established transport network.” See ABARE (2003), Australian Gas Markets: Moving Towards Maturity, eReport 03.23, December, p.19.

The transmission pipeline represented in Figure 2.1, will be a natural monopoly in the transportation of gas from its gas source even if there is gas price competition at the major market due to supply from substitute energy or another gas pipeline from an alternative gas supply region. In these circumstances there will not be effective competition between the pipeline shown in the figure and the pipeline from the alternative region. If they are both natural monopolists with respect to supply from their own supply region, they will be able to raise prices without attracting market entry. The chart assumes price has been raised by around 30%, which is the amount by which the ACCC has calculated the Moomba-Sydney pipeline tariff to exceed a competitive cost structure.⁴

FIGURE 2.1: PIPELINE MONOPOLY POWER SQUEEZES UPSTREAM PROFITS DISTORTING ENTRY, INVESTMENT AND EXPLORATION DECISIONS



Source: BHP Billiton, based on AGA and ACCC data

⁴ See, ACCC (2003), *Final Approval: East Australian Pipeline Limited Access Arrangement for the Moomba to Sydney Pipeline System*, 8 December.

When pipelines exercise market power, upstream gas investment is distorted

If the pipeline shown in Figure 2.1 raises prices above the level that would provide a competitive rate of return, this will squeeze profit margins in the upstream gas supply market and result in lower profits. These lower profits will result in less incentive for investment in the upstream gas production sector of the industry. As a result investment in the competitively structured upstream gas supply industry and gas exploration efforts will be curtailed. This will stop new entry into upstream gas exploration and production, even though entry barriers and economies of scale are relatively low. This will raise wellhead gas prices in the long run and reduce long run consumption and investment.

In the natural gas industry, it is the supply of gas that is critical in developing markets, assuming that the reserves are, or are potentially, commercial. Pipeline and network investments will occur as a natural response to the commercial requirement to provide a means of transporting the gas from wellhead to the point of consumption. Therefore, it is fundamental to ensure that there are no impediments to competition and entry in the gas exploration, supply and retail segments of the industry.

When pipelines exercise market power, downstream gas investment is distorted

The exercise of market power by transmission pipelines will also distort downstream investment in gas networks, because a rise in the long-run price of delivered gas (through curtailment of upstream investment in gas exploration and production) will reduce the volume of gas sold to final customers. As in the case demonstrated in Figure 2.1, transmission pipeline market power will squeeze the margins of gas retailers, making it less attractive for new entrants. In section 2.2 below we demonstrate that whilst gas retailing has at times been characterised as exhibiting low capital cost entry barriers, there are in fact strong barriers arising from economies of scale in back office functions and the difficulty of convincing retail customers to switch from the incumbent retail services provider, particularly on the grounds of convenience.

2.2 Open access is crucial to promote market efficiency

Provision for non-discriminatory open access, is a crucial part of the current regulatory framework under the Gas Code. Open access, combined with appropriate regulation of monopoly pipeline profits is the basis for competition in the industry. Open access can potentially integrate the gas markets into one market, although this is a long way away in Australia.

If the market price for gas received by gas producers is not distorted by monopolistic pricing practices of pipelines with market power, the market will determine optimal signals for risk taking in exploration and development of new gas supply reserves that will bring down the price of gas to consumers.

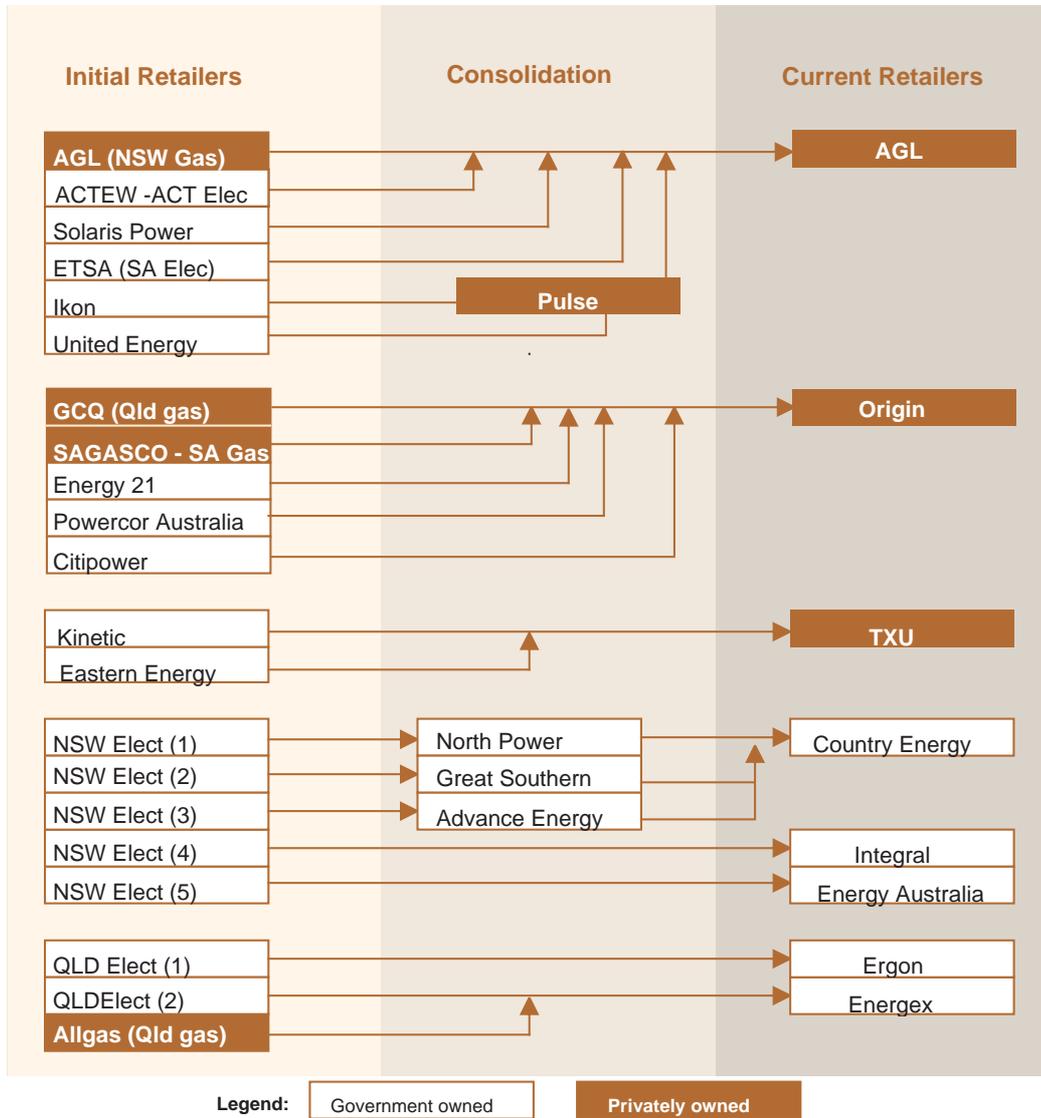
The objective of open access then, is to create a competitive situation in which many buyers face many sellers. In the long term, in a very mature gas market, it is only the local gas distribution network that must remain a natural monopoly. Gas production and supply and gas retailing have low barrier to entry (BTE) characteristics that promote a competitive market structure over time. However, transmission pipelines will retain market power until a number of pipelines under different ownership are constructed from the same gas supply source to the same market. For competition in gas transportation services there needs to be meaningful choice and available capacity.

Vertical ownership structures are the antithesis of a competitive market structure as they enhance market power and distort pricing, consumption and investment. The extensive vertical integration in the industry is detailed on a state-by-state basis in BHP Billiton's initial submission.⁵ Two particular issues of concern in the evolving structure of the Australian gas industry are:

- a) *The reconsolidation of retail businesses* – Despite purported low entry barriers, there appear to be market advantages in re-consolidation of retail ownership in Australia, as shown in the chart below.

⁵ See BHP Billiton (2003), pp. 85-92.

FIGURE 2.2: CONSOLIDATION OF EASTERN AUSTRALIAN ENERGY RETAILERS



- b) *Vertical relationships* – There is a marked degree of vertical integration within some of the main Australian gas industry participants, as shown below for Origin Energy and AGL.

FIGURE 2.3: ORIGIN ENERGY'S COMMERCIAL INTEREST IN THE GAS INDUSTRY IN NSW, VICTORIA, SA AND QLD

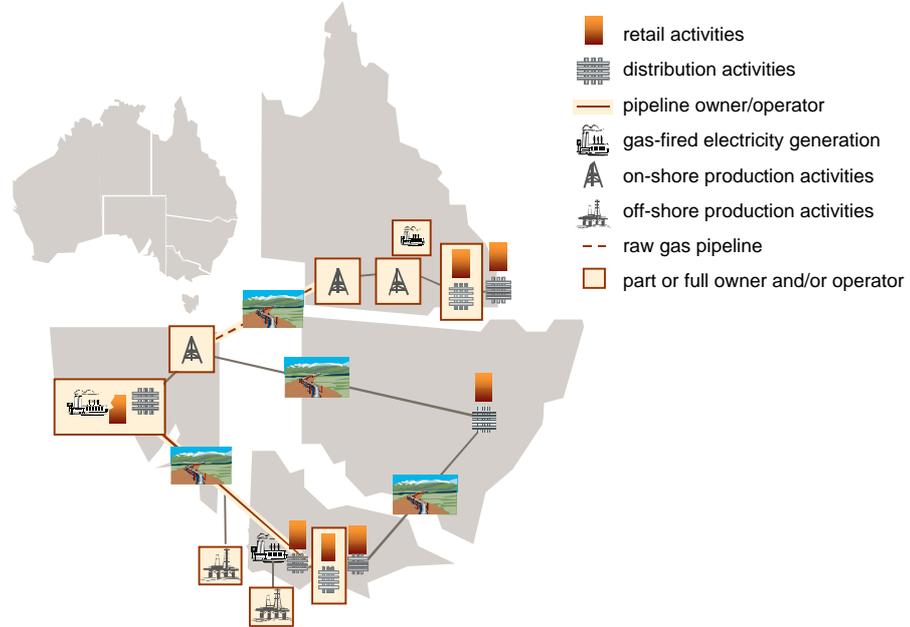


FIGURE 2.4: AGL'S COMMERCIAL INTERESTS IN THE GAS INDUSTRY IN NSW, VICTORIA, SA, QLD AND THE ACT

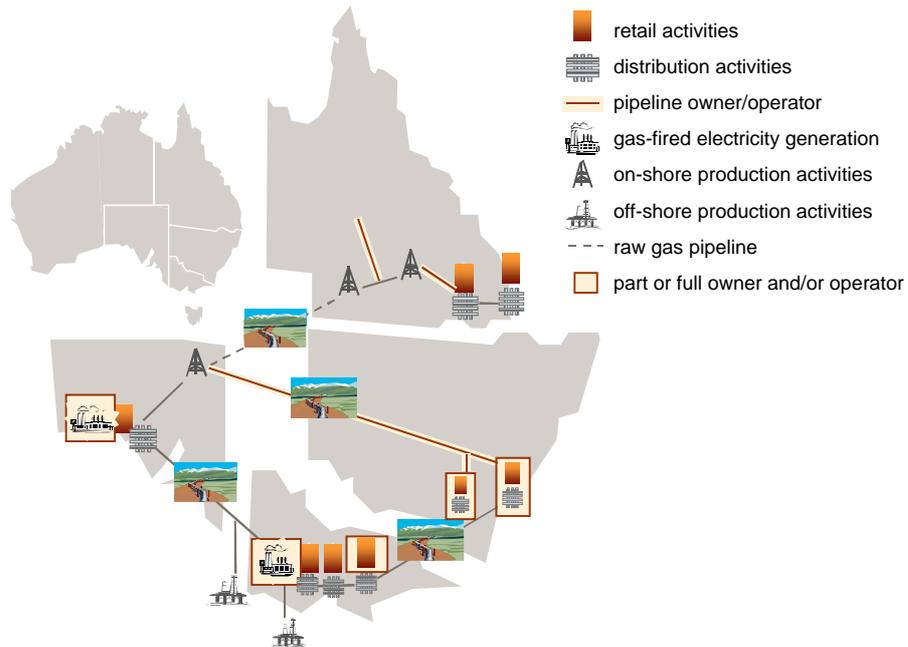
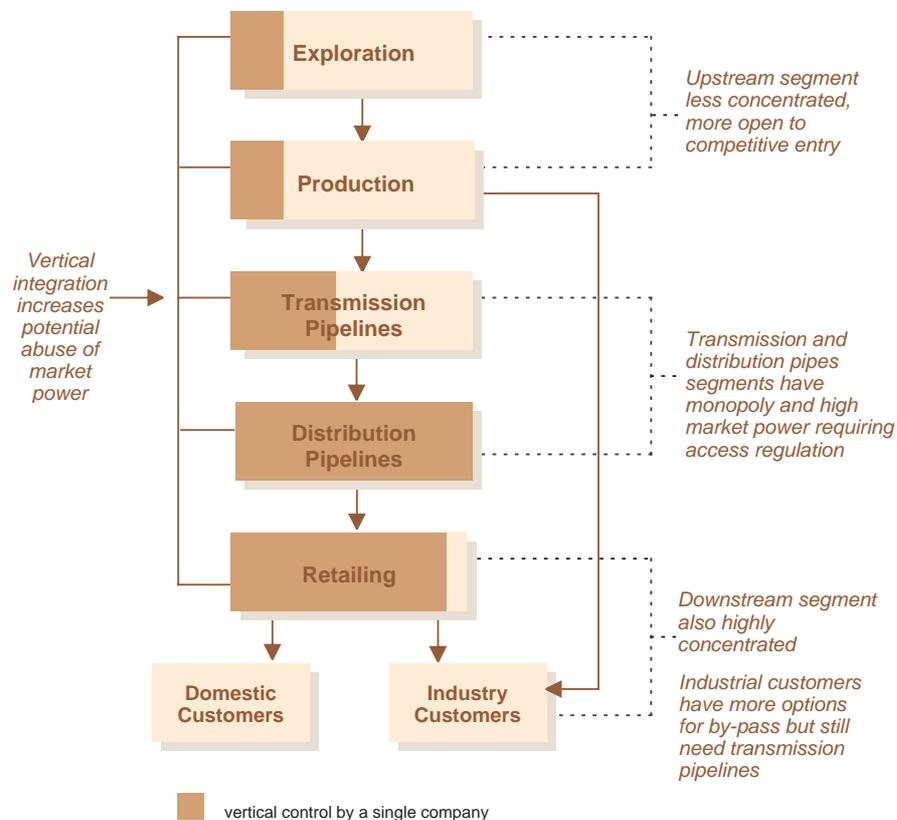


Figure 2.5 below summarises the issues that arise in relation to the vertical structure and varying degrees of competition that exist at different points in the Natural Gas Supply industry in Australia. The exploration and production segments are less concentrated, and more open to new competition due to lower entry barriers. The transmission pipelines are natural monopolies, as are the distribution networks. These two segments require cost of service regulation as long as they hold significant market power, and in chapter 4 we will show that this will be the case for many decades. With respect to retail consumers there is also a concern arising from the re-aggregation of retail operations. Only in the industrial load segments is there a real opportunity for a number of buyers and sellers of gas to interact.

The companies with vertically integrated structures illustrated above can be present at all points along the production and transmission chain. This is a particular concern with respect to retail customers, where switching costs are high. It is in the interests of the shareholders of vertically integrated entities to control the market in a manner that maximises the overall profits (NPV) of the firm. In doing so, prices and outputs will be distorted at various points in the chain. This will result in distorted investment decisions by other current or potential industry participants, and an inefficient social outcome.

This vertically integrated situation, combined with the natural monopoly bottleneck of the pipeline segments, illustrates the necessity of regulation through the Code and in particular, its provision of non-discriminatory open access.

FIGURE 2.5: STYLISED GAS INDUSTRY SUPPLY CHAIN



2.3 Regulation balances investor and consumer interests

The underlying reason for regulation is to balance investor and consumer interests in promoting economic efficiency. Regulation should be applied as long as the marginal benefit exceeds the marginal cost, which is the approach under the current Code. There are many pipelines and distribution systems in Australia, which are not Covered because the benefits of regulation were judged not to exceed the costs.

Investor requirements

Whilst appealing against the Canadian National Energy Board's (NEB) ROE determinations, Mr. Hal Kvisle, CEO of the largest Canadian pipeline company, TransCanada recently (May 5, 2003) had this to say about the characteristics of the ideal regulatory environment:

- Decreases regulatory uncertainty and minimises business risk;
- Attracts low risk, low cost capital;
- Minimises life-cycle costs to shippers; and,
- Provides a reasonable opportunity for recovery of and on capital.

This indicates a broad approach to the gas supply industry, which takes account of the legitimate interests of both investors and shippers. It is in both investors' and shippers' interests that regulatory risks and business risks are minimised, as this will reduce the cost of capital and provide opportunities for lower life-cycle costs to shippers and enhance the opportunity for investors to recover the cost of and on capital. However, while it could be assumed to come under the minimisation of life-cycle costs, Mr. Kvisle does not specifically mention the provision of open access or fair and reasonable terms to shippers.

BHP Billiton agrees that the regulatory regime should minimise regulatory risk for all investors. This has the effect of reducing the required cost of capital, and translates into a reduction of gas prices for customers. In order to reduce risks the regulators need to act in a consistent and predictable manner, avoiding sharp changes in regulatory approach. Now that the Code has been in operation for a number of years and regulatory decisions based on the Code have been subject to judicial review, consistent and predictable outcomes have emerged. A single national regulator, once established, shall further enhance the stability of outcomes under the Code. Any fundamental shift in regulatory approach will increase regulatory uncertainty.

Consumer requirements

It is noticeable that the TransCanada view did not mention final consumers of gas. This is understandable, since North American pipeline companies operate in very mature markets in which there are numerous suppliers of gas shipping through a large number of pipeline companies to numerous consumers. Hence, the minimisation of life-cycle costs to shippers operating in competitive markets, and the holding of profits to a "reasonable opportunity for recovery of and on capital" will maximise efficiency and minimise gas prices to final consumers.

Thus, the objectives of consumers (both shippers and final) can be summarised as:

- Prevention of abuses of market power;
- Maintenance of the non-discriminatory right of open access to pipeline capacity;
- Minimum (efficient) prices, which assumes:
 - a fair (risk adjusted and regulated) rate of return to transmission pipelines and gas networks in the natural monopoly segment of the industry;
 - a fair competitive return to other efficient participants (explorers, producers, retailers) in the contestable segment of the gas supply chain. For example, in the contestable exploration segment of the industry investors require returns from successful wells to cover the risks of the dry wells that are drilled. .
 - and an ability for investors at all levels of the industry to earn superior returns based on superior efficiency.
- Under the Code, prices to match efficient costs of production;
- Appropriate levels of service, reliability, flexibility;

It is in the interests of consumers to promote efficiency in pipeline operation by the provision of incentives to earn a higher rate of return in the event of strong performance. It is also important to note that the consumers of pipeline services are willing to bear the costs of regulation when market power is present. This is not an open-ended objective, since consumers are not interested in bearing the costs of regulation for its own sake. Over-regulation, overly intrusive or inconsistently applied regulation is not in the interests of consumers because it raises costs to all parties and does not achieve most efficient investment and prices. Similarly, under-regulation can result in prices that do not reflect efficient costs and investment.

Therefore, the consumers' requirements are served by applying regulation up to the point at which the net public benefit is maximised. This is what has occurred under the operation of the Gas Code.

2.4 The current Code balances these interests with a dynamic Coverage-Regulation-Revocation process

The operation of any market involves the balancing of conflicting interests. The current regulatory framework encapsulated by the Code, balances the interests of investors and consumers through a three-step process:

- a) *NCC Determination of Coverage* – the NCC applies its criteria to determine whether,
 - a. Market power exists- under criterion (b) this is determined if it would be uneconomic for another pipeline to provide the services;
 - b. Effects on competition – criterion (a) asks whether that market power could be applied to impede competition in upstream or downstream markets, so that access (coverage) would promote competition in those markets; and,

- c. Access would not be contrary to the public interest – in other words, determining whether “the costs of regulated access outweigh the benefits of regulating natural monopoly services with substantial market power.”⁶.
- b) *Regulation of Covered Assets* – the covered asset is subject to access regulation to ensure that access is not unreasonably denied to any shipper, and that tariffs reflect all efficient costs, including an appropriate rate of return on capital;
- c) *NCC Revocation of Coverage* – if market conditions change, so that a previously covered asset becomes subject to effective competition, or demand and supply conditions warrant it according to the criteria, coverage is reassessed and potentially revoked.

The Gas Code’s Coverage-Regulation-Revocation process is flexible and dynamic. It takes account of the interests of all participants and balances those interests in the context of an overall public benefit test. Since the Code came in to operation, history has shown that the process has worked well. A large number of pipeline systems have had coverage revoked and many new transmission pipelines have not been covered.

2.5 Advantages of the current framework

The current framework is clear in establishing a decision rule for governing whether monopoly power should be regulated in the public interest. It is an economic rule that takes account of the net benefits to society from explicit regulation of access tariffs. The current framework has the following advantages:

- a) *Based on cost/benefit analysis* - If there is no market power present, or the costs are found likely to exceed the benefits of regulation, coverage is not recommended;
- b) *Flexibility to market dynamics* - if market structure or technologies change over time, the current framework provides for a re-opening of the question of coverage. For example, if a parallel gas pipeline was planned or constructed, and a change in market structure and potentially competitive behaviour could be established, the NCC would consider revocation of coverage; and,
- c) *Independence* – The role of the NCC in determining coverage is separated from the role of independent regulation (currently by the ACCC or a state-based regulator). Thus, the role of regulator is separated from the decision about whether to regulate.

⁶ National Competition Council (2002), Moomba to Sydney Pipeline System: Revocation Application Under the National Gas Code, November, p.19. The NCC notes that “in applying criterion (d), the Council considers whether the costs of coverage outweigh the benefits. In making its current assessment, the Council has taken account both the direct and indirect costs of regulation under the National Gas Code.”

2.6 Conclusion

The characteristics of the gas pipeline transportation sector are distinguished by a lack of contestability. In the upstream market, new discoveries of gas can radically alter the market structure, but this is not the case for pipelines. When pipelines wield market power they squeeze the profit margins of upstream gas suppliers, which will reduce exploration and production investment. The problems are compounded by the presence of vertically integrated operations. The current Code has worked well in balancing the interests of industry participants through its independence, transparency, and flexibility to changing market conditions. The failure of the National Gas Code to achieve its objectives has not been demonstrated by the PC in a rigorous and defensible manner.

Chapter Three

Gas Pipeline Investment has not been Impaired by the Code

3.1 The investment effects of “asymmetry” have been exaggerated

The PC Draft Report focuses on “truncation” and “asymmetry” of returns, arguing that pipeline investments will be distorted and deferred as a result. A theoretical treatment of asymmetry is presented, based on a set of assumptions that have no basis in the facts of actual pipeline returns. BHP Billiton believes it is dangerous to base public policy prescriptions on a theoretical analysis without reference to empirical evidence.

The PC’s theoretical model is flawed as it assumes a wide dispersion of potential returns that is not present in reality for the following reasons:

Extreme upside scenarios do not exist under competitive conditions – The long and high upper tail of the returns distribution envisaged by the PC Draft Report is not likely given the restricted capacity of a pipeline. Even taking account of a pipeline’s ability to undertake capacity expansion through looping and higher compression, the range of returns presented is unlikely. The PC Draft Report does not demonstrate how, in practice, such returns might be earned under competitive conditions. For example, there is no information from other markets where pipelines experience more competitive market structures and are able to price at market rates.

Downside risk is limited - The downside risk of a pipeline is limited to cases where the market is not there. This is unlikely in a competitive market situation as long as the supply is consistent and markets are strong. If the market were weak, such cases would not be covered, so there would be no issue with “asymmetric regulation”. There are few if any merchant transmission pipelines in Australia. New transmission pipelines are underwritten by foundation shipper contracts in virtually every case. In such cases, it is the shippers who are taking on the risks. In distribution networks, incremental downside risk is even further limited given the spread of customer base and geographic diversification and the ability, under the Code, to roll incremental expansions into the existing asset base.

In the US the response to asymmetry is not deregulation of price caps to expose captive customers to pipeline market power. Rather, the asymmetry that exists has been addressed by sharing of upside and downside performance with customers, and appropriate adjustments to the rate of return. Asymmetry has not been promoted as a reason for ceasing full regulation of tariffs. As discussed in Chapter 4 below, the US Federal Energy Regulatory Commission (FERC) only allows market pricing of natural gas pipeline services without a price cap when it has been demonstrated that the pipeline does not possess market power.

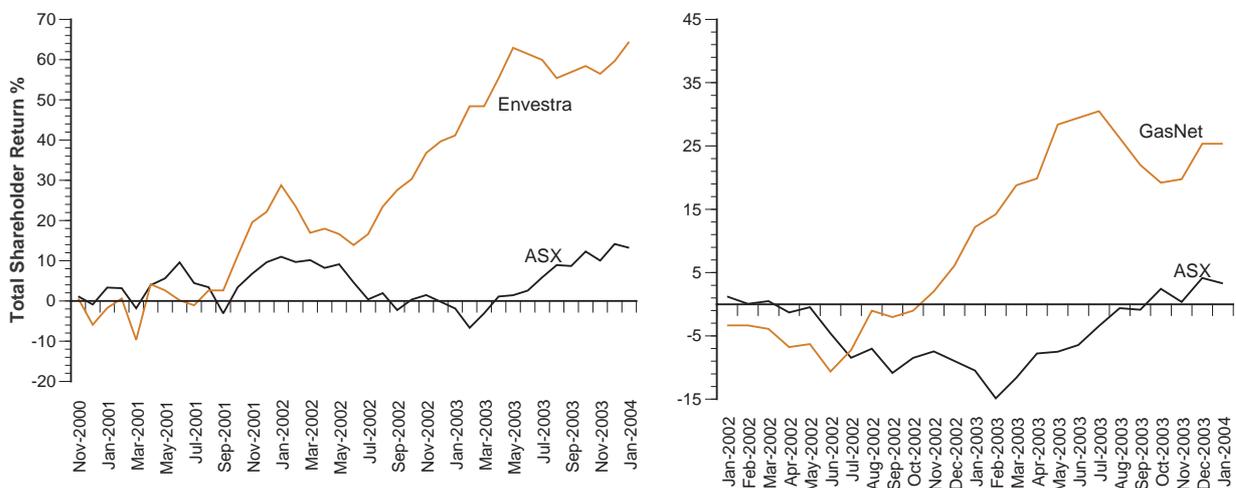
3.2 Pipeline companies have prospered in the equity market

The PC Draft Report makes the unsubstantiated assertion that due to the Gas Code pipeline companies will have difficulty attracting finance and undertaking the investment projects they have identified. If this were the case, we should expect the Australian pipeline sector to be characterised by low shareholder returns, and an inability to raise equity and debt finance due to inferior performance. This is not the case. In fact the reverse is true.

There is overwhelming evidence that pipelines have been a very attractive investment in the Australian equity market, as shown in the chart below. We have deliberately constrained the sample of companies to those that are wholly concerned with gas pipelines. On the comparative chart, it is apparent that in terms of Total Shareholder Return (TSR), Envestra (ENV) and GasNet (GAS) have significantly out-performed the ASX 200 index since November 2000 and December 2001 respectively. GasNet's performance has been particularly outstanding given the stockmarket performance since it listed. The chairman, Mr Rod Keller, summed up the company's prospects in his 2002 address to shareholders:

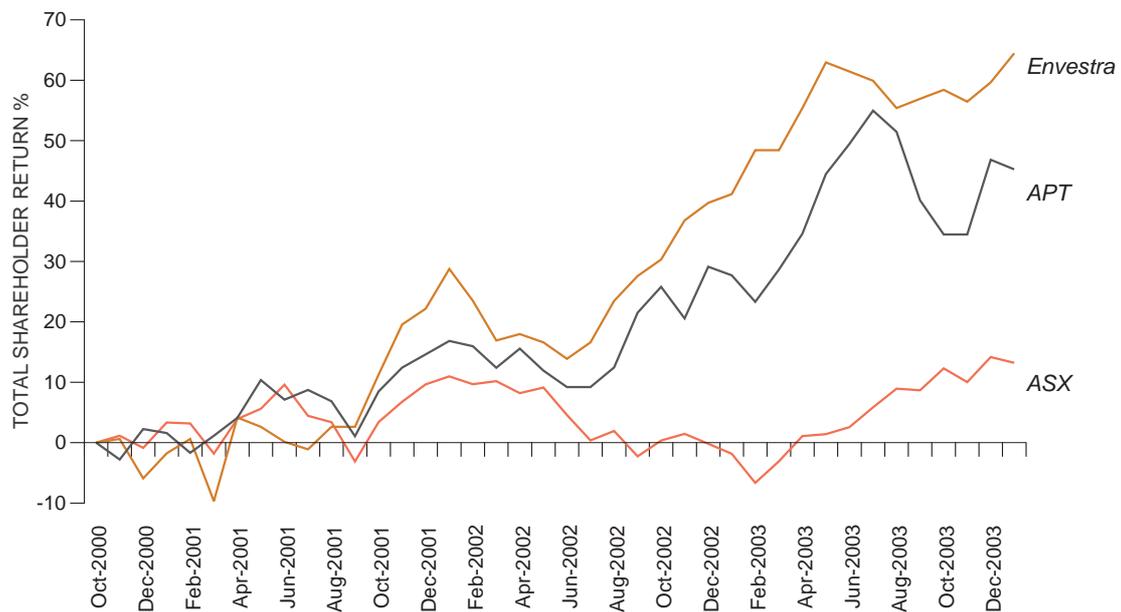
GasNet was the second largest IPO in Australia in the 2001 year. I believe the fact that we were able to raise funds post September 11, and amid a number of corporate collapses, reflects the underlying strength of our business.

FIGURE 3.1: GAS INDUSTRY INVESTMENTS HAVE OUTPERFORMED THE MARKET



Source: Bloomberg Financial Services

From 31 December 2001 until 30 January, 2004, GasNet earned an annualised TSR of 11.46% compared with only 1.56% for the stock market. Envestra's performance can be compared with the market over a longer period. From 29 August 1997 to 30 January 2004, in a generally low interest rate period, Envestra earned an annualised TSR of 11.1%, whilst the market earned only 4.1%.

FIGURE 3.2: INVESTOR PERFORMANCE OF ENVESTRA vs AUSTRALIAN PIPELINE TRUST AND ASX

Source: Bloomberg Financial Services

Figure 3.2 compares the investor performance of Envestra against that of the Australian Pipeline Trust (APT). This comparison is important given the fact that Envestra has relatively greater exposure to the current Code than APT. The comparison shows that Envestra outperformed APT over the period from October 2000 to January 2004.

3.3 Transactions indicate a vibrant market in major gas assets

Since 1999, when the way the Code would be implemented by Regulators became known through actual regulatory decisions, there has been a number major gas assets transacted with exposure to cash flows determined under the Code. There is no shortage of buyers of these assets. The market accepts that the Code provides an appropriate framework under which to invest.

TABLE 3.1: REGULATED GAS ASSETS TRANSACTED SINCE 1999

Date of Sale	Asset	Type of Asset	Purchaser	2002 \$m
1999	Westar & Kinetic Energy	Distribution/Retail	Texas Utilities	1,818
	Multinet & Ikon Energy	Distribution/Retail	The Energy Partnership	2,214
	Stratus & Energy 21	Distribution/Retail	Envestra / Origin Energy	1,877
2000	Transmission Pipelines Australia	Transmission	GPU International	1,089
	AGL transmission pipelines*	Transmission	Australian Pipeline Trust	1,315
	Alinta	Distribution/Retail	Utilicorp/public listing	1,032
2001	Gasnet float	Transmission	Public offering	857
2003	Multinet (United Energy)	Distribution	AlintaGas/ AMP Henderson	1,170
TOTAL				11,372

Note: Data adjusted using CPI All Groups, Weighted Average of Eight Capital Cities.

Source: Origin Energy (2002), Presentation to Institutional Investors in the United States of America, 16 September 2002;

3.3 Pipeline investment has been welcomed by the debt market

A recent example of successful fundraising in the debt market was provided by the Australian Pipeline Trust's Australia-US bond market placement, summarised in the following Media Release.

September 10, 2003 - Australian Pipeline Trust completes US \$325 million private placement

The transaction represents APA's first raising in the bond markets. 13 investors were involved in the transaction, through a combination of A\$ and US\$ tranches. APA raised money at 7, 10, 12 and 15 years, and was able to achieve a weighted average all-in cost of BBSW +94 bps with an average tenor of 11 years... APA accessed both Australian and US investors, a key funding objective. "We were very pleased to have been able to generate participation from Australian investors as well as the US investor base." Comments Jim McDonald, Managing Director. "APA enjoys a strong credit story and we were very keen to be able to offer exposure to global investors..."

Another example of the debt markets' appetite for Australian gas industry issues was recently provided by GasNet's MTN issue:

31 July 2003 - GasNet closes early A150 million medium term note issue due August 2008

GasNet Australia (Operations) Pty Ltd ("GasNet") announced today the pricing of its a\$150 million domestic Medium Term Notes ("MTN") issue, for a term of five years. The issue carries a BBB rating from Standard and Poor's.

Mr. Graeme Fallet, Finance Manager of GasNet, said "that GasNet was particularly pleased how the transaction was received and the solid support from both new and existing investors. As a result of issuing bonds with a five-year tenor, GasNet has extended the duration of its debt portfolio," he said. "This tranche is due for refinancing post the next ACCC Regulatory decision in December 2007."

3.4 Conclusion

Far from facing a "distortion" and "deterrence" due to "regulatory uncertainty", as portrayed in media statements by gas pipeline and network interests (and repeated in the PC Draft Report), gas industry investments have out-performed the equity market. Over the past few years, Envestra, a company with relatively high exposure to the Code has out-performed the Australian Pipeline Trust, which has less exposure by a healthy margin, and has out-performed the equity market by an even larger margin. In addition, we have shown that gas industry debt issues have been oversubscribed. These are not the characteristics of an industry that is hampered by regulatory uncertainty.

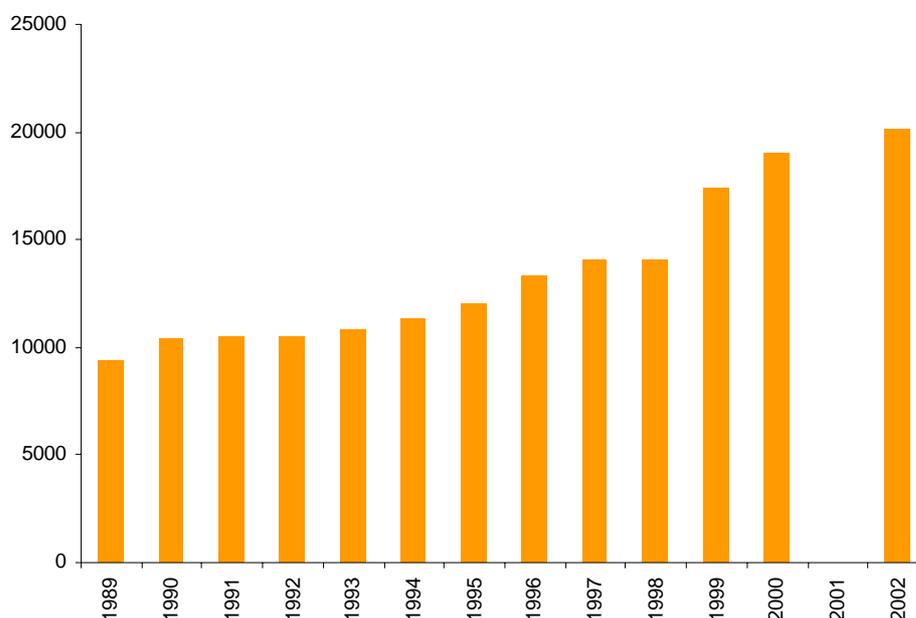
Chapter Four

Growth Means the Code is Working but Pipelines Still Have Market Power

4.1 Growth indicates the Code has operated successfully

Investment in the Australian pipeline industry has been profitable, as we have seen in Chapter 3. That stock market performance is driven by relative security of existing dividend streams and by positive expectations for future growth. By out-performing the general stock market as a whole, pipeline companies have a positive story for the markets. Therefore, it is not surprising that physical growth of the Australian gas industry has been strong during the period of the Code's operation. The growth of Australian natural gas pipelines is shown in Figure 4.1 below.

FIGURE 4.1: AUSTRALIAN GAS TRANSMISSION PIPELINES HAVE GROWN IN LENGTH



Note: These data are based on responses from an annual AGA survey of distributors, pipeline-owners and producers.⁷ No data were available for 2001.

Source: Australian Gas Association, *Gas Statistics Australia*, various issues.

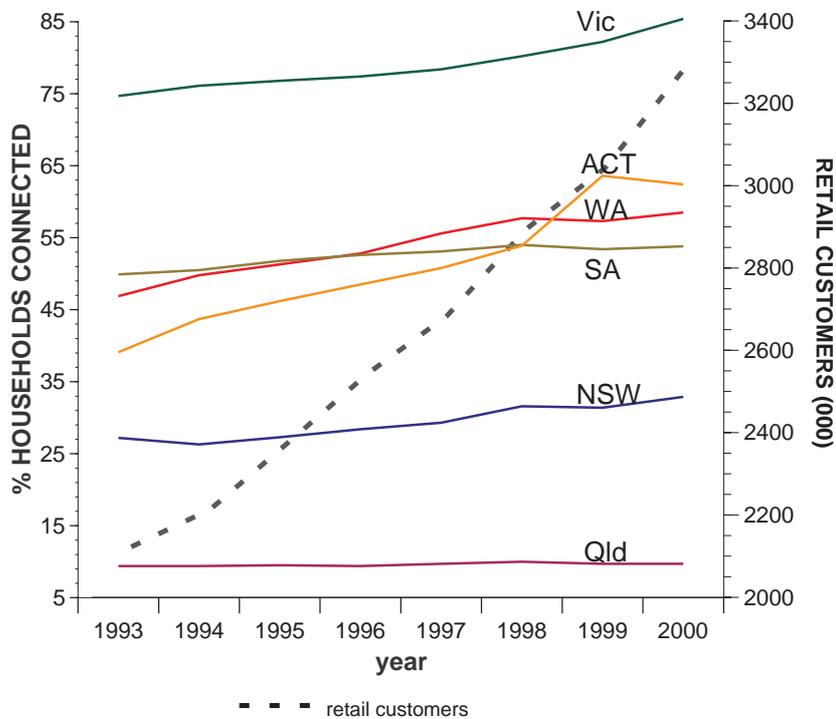
⁷ Data in this figure and elsewhere in this chapter relies on annual AGA surveys of distributors, pipeline-owners and producers. In publishing this data, the AGA note that the comparability and composition of both ABA and AGA gas industry statistics over time has been affected by recent industry restructuring. As such, some caution is needed in making comparisons of data over time.

It is inconsistent to argue, as the PCDraft Report does, that:

- growth in the industry has been hampered by the Code, but
- at the same time, growth has resulted in a market structure in which regulation is not needed because of ‘evolving competition.’

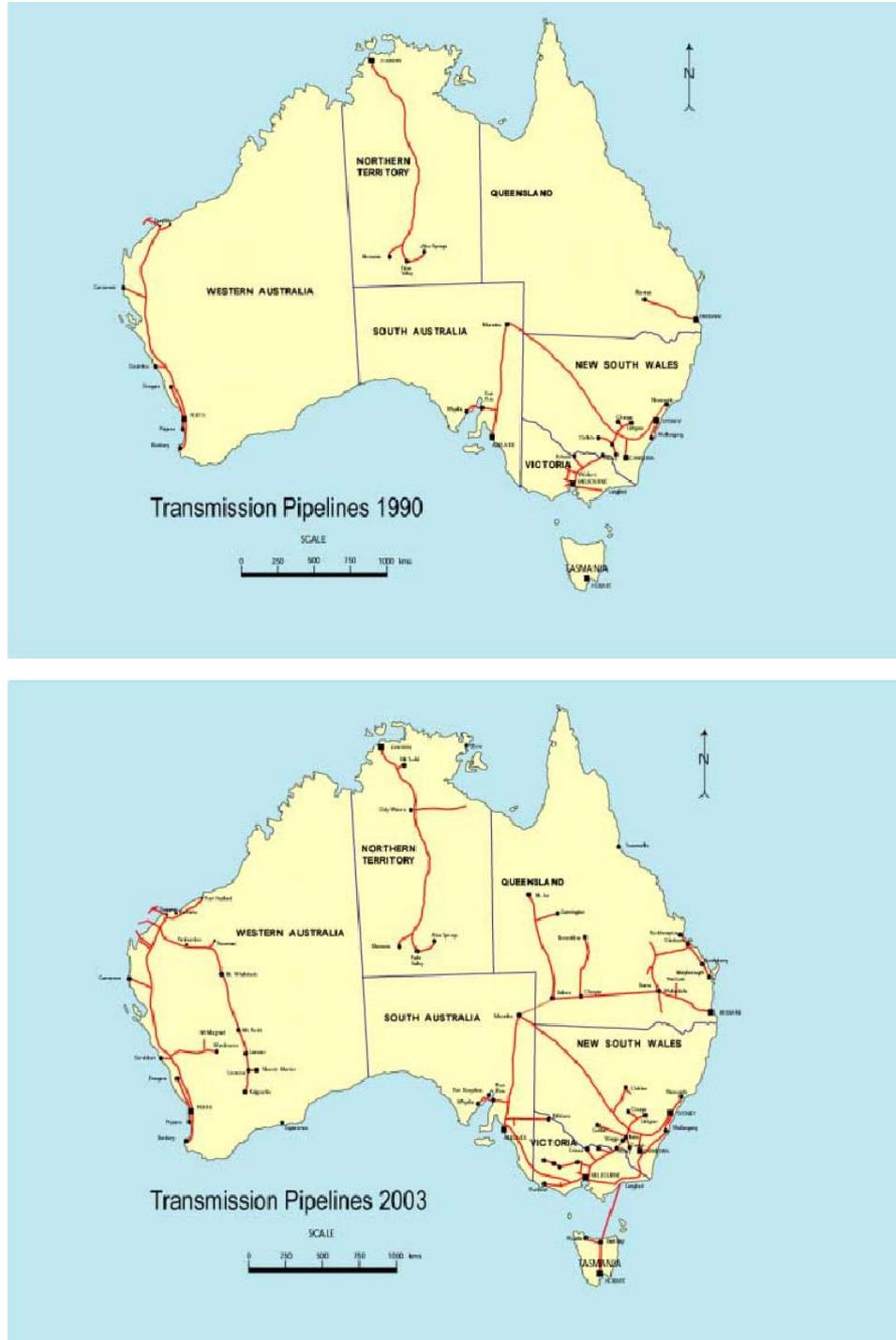
Figure 4.2 shows that gas distribution networks have continued to expand in all states barring Queensland, where the warmer weather reduces consumption opportunities. The number of customers serviced by gas companies has risen by over a million during the period 1993 to 2000.

FIGURE 4.2: A MILLION NEW RETAIL CUSTOMERS HAVE BEEN LINKED TO GAS DISTRIBUTION NETWORKS



Source: Australian Gas Association, Gas Statistics Australia (various issues)

FIGURE 4.3: AUSTRALIA'S GAS TRANSMISSION NETWORK: 1990 & 2003



Source: Australian Pipeline Trust, Interim Results: 6 Months to December 31 2002, Presentation by Jim McDonald, Sydney 5 March 2003.

4.2 Despite growth, the Australian market is still immature compared with the U.S.

The growth in new Australian transmission pipelines, during the period spanned by the introduction of the Gas Code, and shown on preceding page is impressive. However, the Australian Bureau of Agricultural and Resource Economics (ABARE) describes Australian Gas Markets in the following terms:⁸

It may be some time before the Australian gas industry has market characteristics similar to those observed in more mature gas markets such as the United States and United Kingdom, where transparent spot markets in gas and transportation services are considered key industry features of market maturity.

BHP Billiton is in agreement with this assessment of the current state of the gas industry's market maturity. In fact, given the size of our market and our geography, Australia may never reach the maturity of the US or other major world markets. There are two key differences between the Australian industry structure and the more mature North American industry structure:

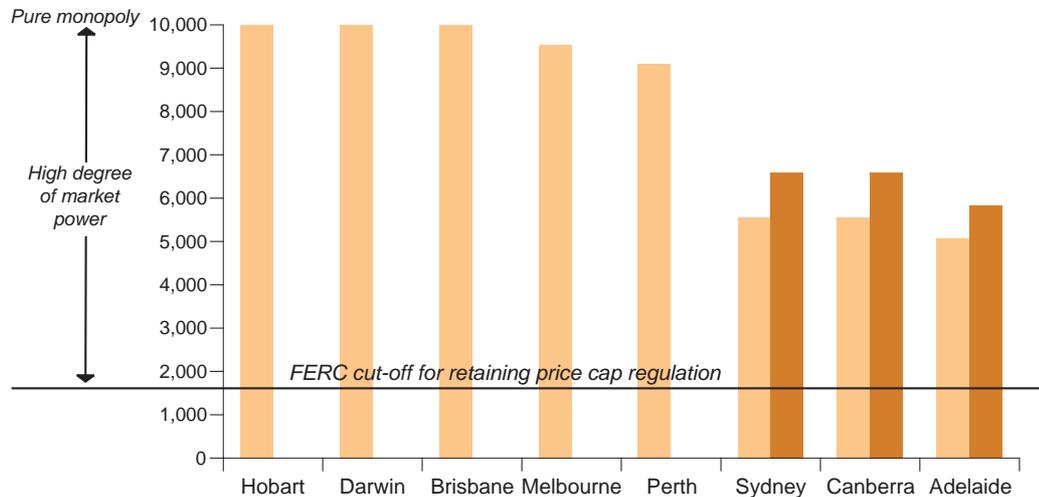
- Australia does not have any meaningful pipeline-pipeline competition from the same gas fields to the same markets.
- Where there is pipeline "competition" from other gas sources, it is ineffective to deter monopoly pricing of transmission services – this is because the competing pipeline(s) cannot generally service the entire market.

4.3 Australia's market structure for pipeline services is highly concentrated

Australia's market structure for pipeline services is highly concentrated, indicating the presence of market power. The Herfindahl-Hirschman Index (HHI) is a widely accepted measure of market concentration, which is used by anti-trust and economic regulators to aid in the analysis of market power. As discussed in Appendix A, an HHI of 1000 to 1800 points is considered moderate concentration, while a level above 1,800 is considered to be highly concentrated.

- Figure 4.4 below demonstrates that a number of the capital city markets in Australia are serviced by monopoly transmission pipeline service providers (HHI = 10,000). In the larger markets there is either a near monopoly of very high concentration of market power as measured by the HHI Index.

⁸ ABARE (2004) website www.abare.gov.au.

FIGURE 4.4: HHI TRANSMISSION PIPELINE AND NETWORK MARKET POWER INDEX

Source: PC Draft Report, ACCC. For Sydney, Canberra and Adelaide, the dual columns represent maximum and minimum HHI based on capacity vs estimated throughput.

While not shown in Figure 4.4 the HHI for distribution networks throughout Australia is 10,000 indicating a pure monopoly. In order to prevent the abuse of market power, these monopolies require cost of service regulation.

In eastern Australia the relatively high HHI (ie. high degree of market power) calculated for the transmission pipeline sector may be contrasted with the competitive structure of the natural gas production sector, which has a much lower HHI. This is in large part due to the market reforms undertaken in the 1990s, including the introduction of the Code.

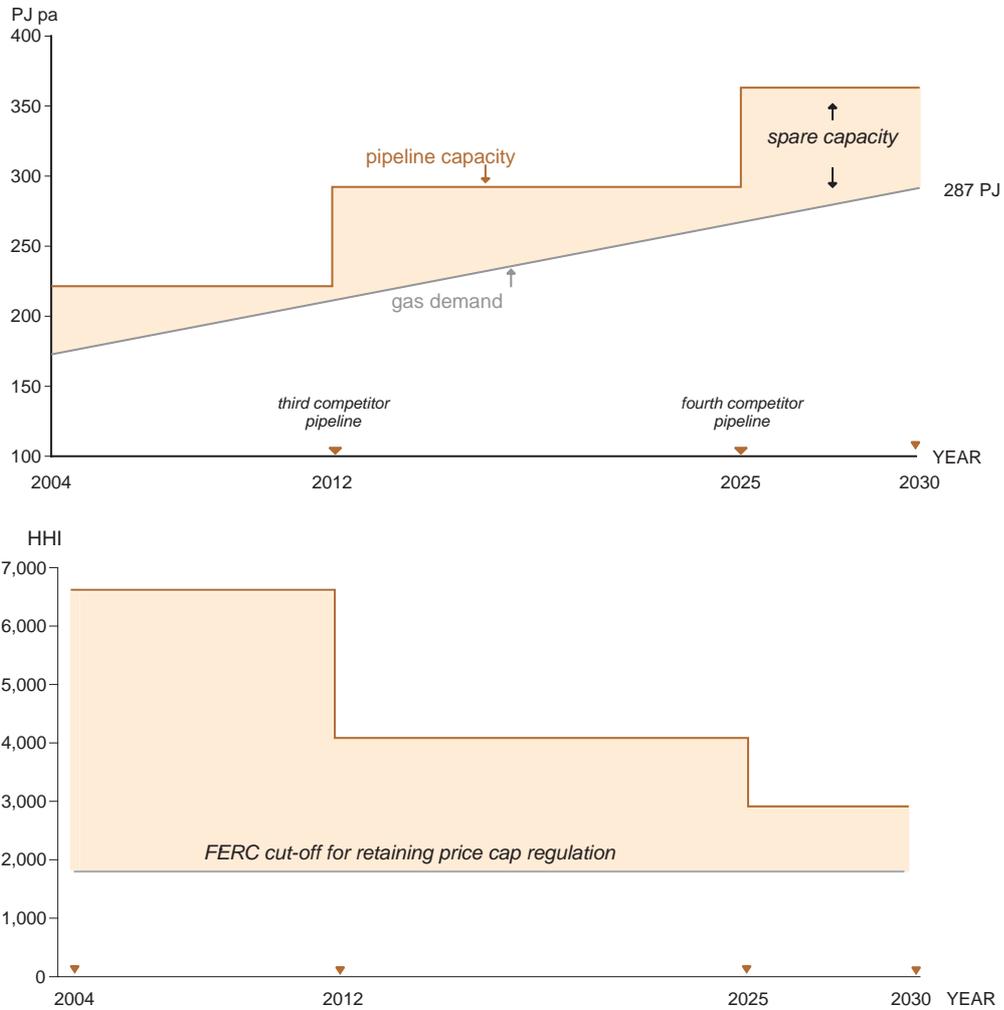
By providing an investment environment in which shippers and customers can be more certain that market power will not be applied by pipelines, significant new entry and investment has been attracted into upstream supply. Thus, the provision of non-discriminatory and open access under the Code, has and is continuing to stimulate a diverse supply of gas which is the fundamental driver of competitive gas prices over the longer term. In Australia the Code has had the same supply effect as the provisions for open access and unbundling of gas and pipeline costs had under the US reforms.

Figure 4.5 provides an analysis of how the currently highly concentrated Sydney and Canberra markets might be expected to develop under ABARE's assumptions of market growth and the most optimistic (and highly unlikely) of new entry scenarios.⁹ In normal circumstances we would expect the incumbent pipelines servicing Sydney and Canberra, APT and Duke, to protect their positions. However, if it is assumed that they allow new entrants to enter the market, at the same level of entry as Duke has undertaken, the HHI Index of market concentration will fall to what can be regarded as a situation of more effective competition only after about 40 years.

⁹ This is an extrapolation of ABARE projections contained in Dickson, A., Akmal, M. and S. Thorpe, (2003), *Australian Energy: Projections to 2019-20*, ABARE Research Report, June, Canberra.

This is an important conclusion: under the most optimistic entry scenario, pipelines will continue to wield market power in Sydney/Canberra for at least another 40 years.

FIGURE 4.5: TRANSMISSION PIPELINE MARKET POWER IN SYDNEY/CANBERRA WILL CONTINUE FOR AT LEAST ANOTHER 40 YEARS



US pipelines are regulated despite a mature market structure

The PC Draft Report appears to completely ignore the experience of the world’s most developed natural gas market, the United States. In the US, gas pipelines continue to be regulated in spite of the much more mature, complex and interconnected market that exists there.

Characteristics of the US Market Structure

The US natural gas industry is vastly larger than the Australian industry with consumption of 26,000PJ/pa compared to 550PJ/pa in eastern Australia. Around 130 pipeline companies (30 'majors') connect a number of major gas supply sources with several major markets. The major markets are located in the north east of the US, while the major supply sources are found in the Gulf of Mexico, Mid-West and Canadian (Alberta) regions.

The major difference between the US and Australian gas pipeline industries is that in the former there are often several alternative gas pipelines connecting a major gas supply source with a major consumer market. In these circumstances, gas pipelines may no longer be natural monopolists.

Important characteristics and trends of the current US gas market are:

- Increasing interdependence between the commodity and transportation markets;
- Increasing integration between the electricity and gas markets;
- Gas supplies are now flowing south and east as well as north;
- There are around 40 gas trading points giving shippers greater gas and capacity choices;
- Options and futures contracts are used to hedge risk;
- 'Virtual pipelines' are being created by interconnects between parallel pipelines;
- E-commerce has dramatically increased market liquidity

These characteristics may never emerge in the Australian market given its lack of scale.

FERC Order 637

FERC Order 637 was issued in February 2000. It provides pipelines with the ability to make a submission to FERC to demonstrate that their market is subject to sufficient competitive pressures to justify the relaxation of regulatory oversight from explicit tariff rate making to one of market monitoring. The distinguishing features of this approach are:

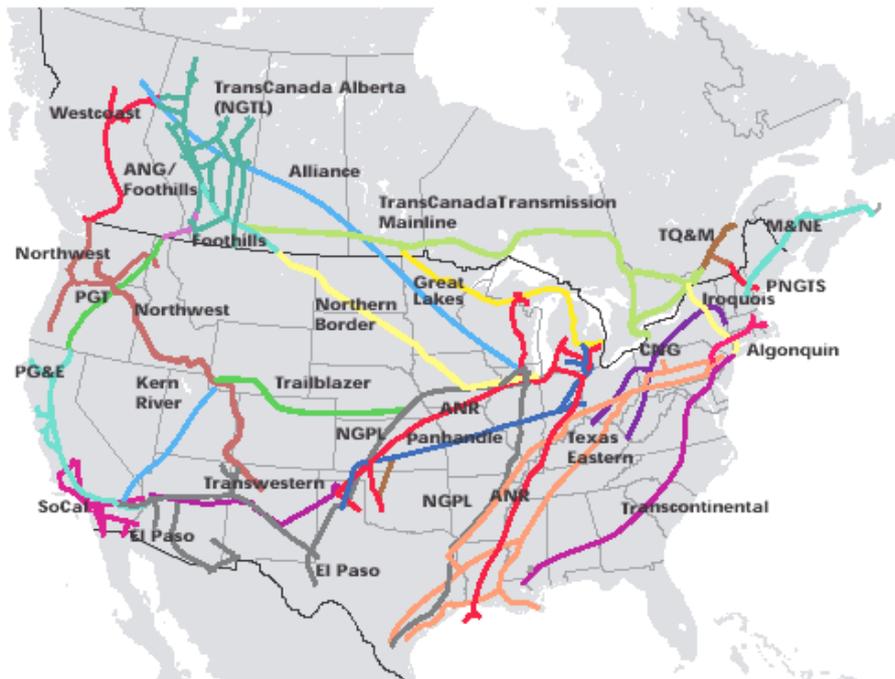
- a) *A competitive market structure has to be demonstrated* – the major criteria for pipelines to demonstrate that market power is not present are:
 - Concentration in the relevant market using the Herfindahl-Hirschman Index (HHI).
 - An HHI cut-off above 1800 indicates significant market power is present.
 - The HHI is calculated based on non-contracted market share.
- b) *A cautious approach was adopted* – the ability to set market based rates was initially restricted to shorter-term contracts (under 2 years) and would be reviewed by FERC over a two year period.
- c) *The information requirement was increased* – rather than lightening the information requirement of companies being allowed to set market transmission rates, the information-reporting requirement for such companies was increased.

The US approach in adopting Order 637 are instructive, particularly the market structure rules and caution that is being exercised. It is also important to note that the information requirement under “light handed regulation” was increased. This demonstrates that the move to a market based rate setting environment in certain circumstances was not driven by questions about the cost of regulation, nor about notions of distortion of investment and asymmetric risks – it was driven by the goal of reducing the cost of gas to consumers.

US Order 637 Experience: Only Four Market Based Requests and None Succeeded

Due to the strict HHI-based criteria applied by FERC, there have been only four market rate requests in the US and none succeeded. US transmission pipelines continue to be subject to price caps.

FIGURE 4.3: THE U.S. HAS A MATURE, REGULATED GAS PIPELINE INDUSTRY



Source: National Energy Board

4.4 No cost/benefit analysis has been undertaken to justify deregulation

FERC Order 637 made the following point about regulatory change:¹⁰

“The ultimate test of any regulatory change is the impact of these changes on consumers... [the] ... price they pay for natural gas.”

The Productivity Commission appears to have lost sight of this fundamental issue, by placing inordinate emphasis on the protection of pipeline investor interests. Major changes to the Gas Code regulatory framework should be justified/supported by detailed cost-benefit analysis, but the PC Draft has not undertaken any. In fact, the PC has undertaken no analysis of any actual evidence to support its prescriptions:

- Not one regulatory decision is analysed to see if the regulator-allowed returns are inadequate or would deter future investment;
- Not one claim that the Gas Code has deterred or distorted investments that might have taken place has been investigated in detail;
- Not one coverage decision is analysed for its appropriateness in terms of the cost/benefit analysis undertaken by the NCC;
- While “large” (un-estimated) costs of regulation are cited, no analysis of the benefits of regulation are undertaken.

Yet, on the basis of no real evidence, the PC Draft Report suggests fundamental changes to the Gas Code. We have seen the much more cautious and rigorous approach undertaken by FERC in the introduction of Order 637. In a wider context, considering the justification of regulatory oversight in a number of industries, the US Office of Management and Budget (OMB) has concluded that existing data on benefits and cost of programs “would not support a recommendation to eliminate or reform any particular program,” and they provide a much more sophisticated analysis than has been undertaken in the PC Draft Report.

4.5 Conclusion

The PC argues that Australian gas pipeline markets are subject to “evolving competition.” In fact, the Australian gas industry is immature when compared with the large and developed North American market. In the US, gas transmission pipelines are subject to maximum price caps set by a cost-of-service methodology. While the regulator, FERC, allows market pricing (and monitoring) when a competitive pipeline market structure can be proven, no pipeline has successfully argued the case. The US benchmark for considering a pipeline market structure for market pricing is a Herfindahl-Hirschman Index (HHI) of 1,800. In Australia, half the capital city pipeline markets exhibit an HHI of 10,000 (pure monopoly), and the other half are all well over 5,000. An indication of the market power held by Australian pipelines is provided by the fact that under the most optimistic (and highly unlikely) new entry assumptions, the Sydney/Canberra markets will not reach the FERC cut-off for at least another 40 years.

¹⁰ FERC (2000) *Order No. 637*, February 9. p. 19.

The PC has undertaken no cost-benefit analysis in its Draft report to justify the de-regulation it proposes. This is contrary to good public policy and the practice adopted in other markets such as the US. The PC has ignored the numerous cost-benefit analyses that the NCC has undertaken as a component of its coverage/revocations decisions. Nowhere has the PC challenged and invalidated any of these cost/benefit analyses.

Chapter Five

Shortcomings of the PC's Proposed Deregulation Model

5.1 The Objects Clause Requires Adjustment

BHP Billiton agrees with the PC Draft report's proposal to insert an overarching "objects clause" into the Gas Code to provide greater clarity and reduce uncertainty. However, BHP Billiton does not agree with the specific wording of the PC's Draft Recommendation 5.1, nor with its associated Draft Recommendation 5.2.

The PC's Draft Recommendation 5.1 recommends that the following objects clause should be inserted into the Gas Code:

To promote the economically efficient use of, and investment in, the services of transmission pipelines and distribution networks, thereby promoting competition in upstream and downstream markets.

Part of the logic for having an overarching objects clause was to strip down to a bare minimum what is required to ensure the promotion of the other supplementary objectives. As it stands, Recommendation 5.1 could be taken to read that a key objective of the Code is "to promote ... investment". However, if economically efficient use of infrastructure, upstream and downstream competition is promoted by the Code, investment should also be promoted. The objective of regulation is to "facilitate", and not "promote" investment. This confusion between facilitation and promotion of investment can be traced back to the PC's September 2001 overarching Review of the National Access regime.¹¹ Unless this reference to investment is removed from the objects clause, it will give the impression of being "pro investors" but not necessarily pro-shipper or pro-customer. The careful balance that was purposely crafted in to the Code in its original drafting shall be lost.

BHP Billiton's proposed overarching objects clause (re: Recommendation 5.1) is:

To promote the economically efficient use of the services of transmission pipelines and distribution networks, thereby promoting competition in upstream and downstream markets.

If the promotion of investment is retained, the phrase "prevents abuse of market power" should be added to balance the wording. However, this would not be BHP Billiton's first choice. Instead, it is suggested that three of the related objectives in the introduction of the Gas Code, which the PC Draft Report wants to drop (Recommendation 5.2), be retained.

¹¹ Productivity Commission (2001), *Review of the National Access Regime: Inquiry Report*, Report No. 17, 28 September. For example pages xxv and xxxvii speak of facilitating investment, while recommendation 6.1 (p. xxxii) states the object is to "promote ... investment"

BHP Billiton proposes retention of fewer and simplified supplementary objectives as follows:

- a) Prevents abuse of market power;
- b) Provides for rights of access that are fair and reasonable; and
- c) Provides for the resolution of disputes.

The first supporting objective makes it clear that regulation is fundamentally about curbing the abuse of market power, which does not come through in the neutral sounding Recommendation 5.1. When introducing Order 637, FERC outlined its regulatory objectives in the terms shown in the box below. The emphasis of the “objectives clause” in the US is on protection of captive customers from the abuse of market power by pipelines. This is diametrically opposed to the transmission pipeline and distribution network-focused approach adopted for Australia by the PC.

BOX 5.1: OBJECTIVES OF THE US TRANSMISSION PIPELINES REGULATORY FRAMEWORK

“Protect captive customers from pipeline market power”

Overall Objective:

To ensure that pipeline rates are “just and reasonable and not unduly discriminatory”

Natural Gas Act Sec 4, 15 U.S.C. 7171(d)

Two Principal Objectives:

- Promote competitive and efficient markets, while mitigating market power and preventing undue discrimination, especially for the Commission’s “prime constituency, captive customers vulnerable to pipelines’ market power”.
- Foster an efficient market that provides good alternatives to as many shippers as possible while at the same time creating a regulatory framework that is fair and protects captive customers without good alternatives.

Subsidiary Objectives:

- Ensure that reliable information is available to better enable shippers to make informed choices in the market and to permit shippers and the Commission to monitor for undue discrimination and the exercise of market power.
- To the extent adequate competition does not exist, regulation needs to mitigate residual market power and protect captive customers.
- Regulation needs to be fair and administratively efficient, so that the regulation itself does not impose undue or unnecessary costs on the industry.

Source: United States of America Federal Energy Regulatory Commission, Order No.637, Final Rule.

By not mentioning the prevention or mitigation of market power, the objects clause proposed by the PC Draft Report loses sight of what the underlying reason for regulation is in the first place. It is there to curb or mitigate the market distortions that arise from the abuse of market power. Two supplementary objectives have been dropped from BHP Billiton's proposal. The current supplementary objective a), "facilitates the development and operation of a national market for natural gas" would be a natural outcome of BHP Billiton's overarching clause because of economically efficient use and promotion of competition in upstream and downstream markets. Former objective c), "promotes a competitive market for natural gas in which customers may choose suppliers, including producers, retailers and traders" is supplanted by the phrase "promoting competition in upstream and downstream markets," at the end of the proposed overarching objects clause.

However, BHP Billiton's suggested supplementary clause b) is required because the overarching clause does not spell out how "economically efficient use" of the services of transmission pipelines and distribution networks, and the promotion of competition should be achieved. Open and non-discriminatory access is a fundamental issue for shippers and customers. The current "rights of access" clause is simplified to delete reference to the parties subject to the "fair and reasonable" terms and conditions, as this is obvious. Finally, proposed supplementary objective c) "provides for the resolution of disputes" is not duplicated, conflicted or a consequence of any of the above clauses, yet it is another fundamental objective of the regulatory framework. Therefore, BHP Billiton proposes its retention.

Regulatory discretion can never be eliminated from frameworks such as the Code and nor should it be. However, BHP Billiton believes that Australian regulators have used their discretion in an appropriate manner to promote a fair and efficient outcome with respect to industry participants and consumers, and that this regulatory approach has contributed to the growth of the Australian gas industry. We expect Australian regulators to continue to administer the Code in a fair and balanced manner, particularly now that they have received judicial guidance on a number of contentious issues.

5.2 The Two-tiered Coverage Test is Flawed

Law firm envisages a "two-tiered" legal and regulatory "gridlock"

The Two-tiered regulatory approach proposed by the PC Draft Report adds unnecessary complexity, and increases uncertainty for customers and investors by introducing more scope for 'regulatory error' than before. According to law firm Allens Arthur Robinson, the PC's approach "has the potential to create more uncertainties than it resolves" and "raises complex questions of interpretation for the National Competition Council (NCC) to address in its coverage assessments."¹² Under the proposals, the coverage application would need to:

- a) determine the meaning of 'economic efficiency' in the context of the relevant services;
- b) establish the existing level of economic efficiency;

¹² See *Focus: Energy – February 2004*, www.aar.com.au.

- c) assess if, how and by how much (increased) access is likely to increase the level of economic efficiency;
- d) determine whether that increase would be ‘significant’;
- e) establish whether access would be likely to ‘increase’ competition in another market;
- f) if so, determine whether that increase would be ‘material’ and/or ‘substantial’;
- g) apply the remaining ‘uneconomic to develop another pipeline’ and ‘public interest’ criteria.

Allens Arthur Robinson believes that paradoxically, “any ambiguity could result in numerous appeals and reviews, adding to delays that the Commission identifies as one of the existing regime’s deficiencies.” In fact, as flagged by the Australian Government Solicitor, both ‘substantial’ and ‘material’ are capable of different meanings in different contexts, “and may indeed mean the same thing.” As a result of the confusion Allens Arthur Robinson foreshadows a run on the NCC, for reconsideration of coverage decisions, resulting in the tying up of many resources of the NCC.

If the above scenario eventuates, it is easy to see regulators, companies and other interest groups tied up in a gridlock for years. The resulting uncertainty could result in delayed investments and costs that would harm the interests of investors and gas customers alike.

The PC has not analysed the costs and benefits of regulation under the Gas Code, but the NCC has

The inspiration for the idea of a two-tiered test can be traced to the PC’s 2001 Review of the National Access Regime. There it was argued that,¹³

To provide some immediate assurance against the still present possibility of inappropriate declarations, the Commission is recommending that the first of the declaration criteria be strengthened. Specifically, declaration would have to promote a substantial increase in competition in another market, rather than simply promoting competition in another market. This should help to guard against the possibility of declarations where there would be little prospect of a gain in efficiency, given the likely costs of intervention.

In its 2001 Review, the PC also stated its intention that “subsequent declaration decisions be examined in the next review of Part IIIA, with a view to determining whether further strengthening of the criteria is required.” This examination of NCC determinations has not been undertaken by the PC as part of its review of the National Gas Code. Now the PC is suggesting that “substantial” be imposed as a test when it hasn’t even suggested with a case study how it be operationalised.

¹³ Productivity Commission, (2001), *Review of the National Access Regime: Inquiry Report*, Report No. 17, 28 September, pp. xxiii-xxiv.

By contrast, the NCC states that when it applies criterion (d) it “considers whether the costs of coverage outweigh the benefits.” Not one of the NCC’s cost/benefit decisions on coverage has been challenged by the PC.

The cost of regulation could rise, not fall under the PC’s proposals

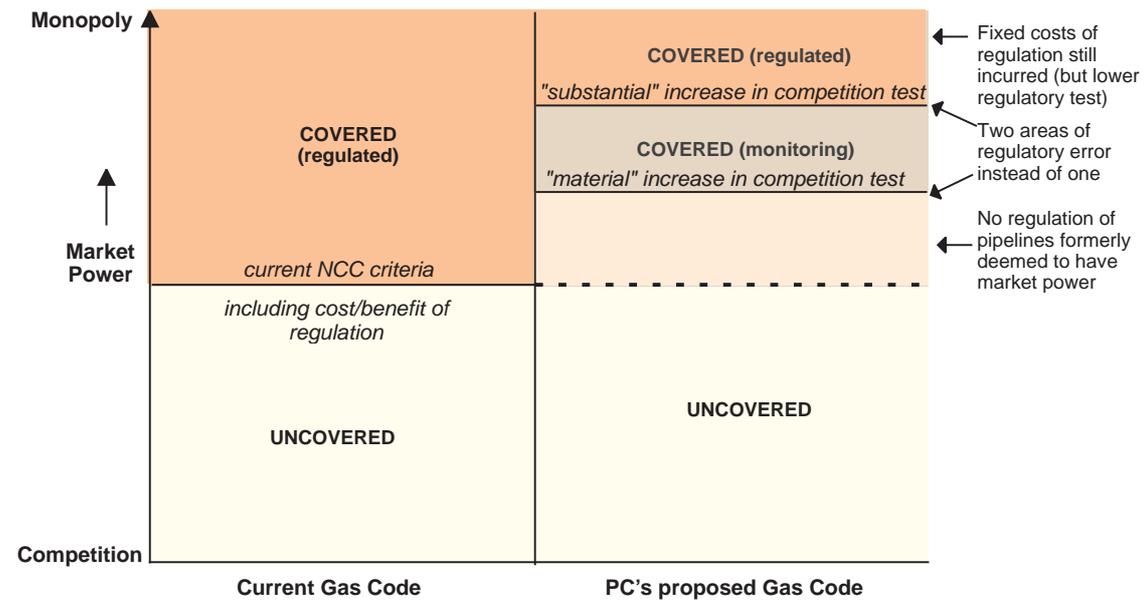
The legal and regulatory gridlock would necessarily increase costs to society, as the effort and costs of current access cases would be diverted to more complex and lengthy deliberations centred around the NCC. However, even without those additional costs and delays, there are no grounds for expecting regulatory costs to fall much, if at all, as a result of the PC’s Draft proposals, since:

- Fixed costs of full access price regulation of pipelines resulting in a ‘substantial’ lessening of competition would still be there, so the marginal cost reduction on the regulatory side will be low;
- There will be incentives for pipelines to game the regulator in relation to the numbers to maintain an information asymmetry advantage;
- As we have seen by the example of FERC Order 637, the information requirements for proper monitoring could involve more costs in gathering and analysis than an access arrangement under the current provisions of the Code. .

Difficult economic interpretations

The terms “material” and “substantial” are difficult to interpret legally and in economics and are likely to result in legal challenges and expert opinions that will leave a significant “grey area”. The PC Draft proposals on coverage can be illustrated with the following chart:

FIGURE 5.1: PRODUCTIVITY COMMISSION’S GAS CODE PROPOSALS



Cost of effective monitoring is not too different from full regulation – a monitoring regime, if it is to be effective, will need to be information intensive. Without detailed information, the regulators will not be able to make valid comparisons that would enable them to assess whether tariffs and conditions are reasonable. The cost of providing information to undertake this task would not be much different from full regulation. Regulatory costs would not fall much as the fixed costs of maintaining core capacity for the full access regulation of distribution networks would still need to be retained.

Monitoring invites gaming - If market power is present it should be regulated, as monitoring only invites gaming. This is not to say the gaming does not take place under full access regulation, but the scope for gaming and information asymmetry increases unless full and detailed disclosure is required. Currently, most delays in the assessment of access arrangements under the Code have centred on the provision of information.

Box 5.2 The “Counterfactual” is rising transmission charges

The PC Draft Report claims that the “counterfactual”, or what would have happened in the absence of the Code is not visible. If that were the case, it would be difficult to make a case in favour of changing the Code, as there would be no information to support the need for a change. The Draft report provides no information on the counterfactual, however, such evidence can be seen in natural gas transmission prices in the US and pricing behaviour in other markets where market monitoring is undertaken:

- **The ACCC calculated Moomba-Sydney Pipeline prices 32% above the competitive level** – In 2003 the ACCC undertook a review of tariffs charged on the Moomba-Sydney pipeline indicating they were 32% above the levels justified by a competitive benchmark.¹⁴
- **US gas transmission prices fell following explicit access regulation** – The EIA estimated that in the US, the open access reforms reduced gas prices by US\$ 6.5 billion, including “2.5 billion in reduced transmission and distribution charges.”
- **Pipelines raised prices during the Californian power crisis** - FERC discovered that Transwestern Pipeline charged unjust rates, well above the FERC-determined maximum rates, to Sempra Energy and others during the Californian power crisis.¹⁵ This demonstrates that if market power is present it will be used, unless mitigated by cost-reflective regulation.
- **Airport charges have risen 63% since the monitoring regime** – The ACCC has recently reported that, “total aeronautical revenue generated by the monitored

¹⁴ See ACCC (2003), *Final Approval: Access Arrangement by East Australian Pipeline Limited for the Moomba to Sydney Pipeline System*, December 8. The ACCC has found that the EAPL transportation tariff from Moomba to Wilton is 66 cents vs. the 50 cents it has calculated as the price under effective competition, a difference of 32%.

¹⁵ See Reuters News Service (2002), “FERC orders Enron pipeline to pay refunds in California,” July 17, where it is noted that “Transwestern charged Sempra \$231,817 and Richardson Products \$143, 283 for gas shipments on Feb. 14, 2001. Under its tariff, Transwestern should have charged slightly less than \$3,800 for each contract per day, FERC said.”

¹⁶ ACCC (2004), *Airport price monitoring and financial reporting*, February, p.7.

airports increased by 63 per cent to \$494 million between 2000-01 and 2002-03. Increases at the individual airports over this period ranged from 49 per cent to 131 per cent.”¹⁶

The whole point of the market reform process was to raise Australia’s efficiency and international competitiveness. This objective could be undone by inappropriate adjustments to the Gas Code.

5.4 The PC’s Dilution of the Access Pricing Principles

The PC’s Draft Recommendation 7.1, which seeks to revise Section 8.1 of the Gas Code is set out in Box 5.3 alongside the existing clauses of the section.

Section 8.1 (a)

The Code’s Sec. 8.1(a) declares that reference tariffs should be set in order to provide the Service provider with an “opportunity” to “earn a stream of revenues that recovers efficient costs.” This is the appropriate wording, because regulation should not allow an investor-owned service provider to provide investors with a guaranteed rate of return. In section 2.3 above we highlighted that in a recent presentation the CEO of TransCanada, Mr Hal Kvisle, spoke of the ideal regulatory environment providing his company with “a reasonable opportunity for recovery of and on capital.”

In contrast, the PC’s Draft Recommendation 7.1, which again is drawn from its 2001 Review of the National Access Regime, wishes reference tariffs to be set “so as to generate expected revenue across a service provider’s regulated services that is at least sufficient to meet the efficient long run costs of providing access.” This wording is potentially confusing since the words “at least sufficient” connote a degree of certainty with respect to costs, while the word “expected” indicates that revenue is uncertain. In reality, both are uncertain.¹⁷ In any case, the suggested wording is superfluous, complicates and does not improve the meaning of the existing sec. 8.1(a).

The PC’s specific inclusion of an investment return that is “commensurate with the regulatory and commercial risks involved” is also indicative of its minimal regulation stance. Australian regulators already take account of the “regulatory and commercial risks” by referencing their access pricing decisions to market data that incorporates these risks. Specific allowances are already provided to regulated companies to compensate for “asymmetric regulatory risk.” It is instructive that the

¹⁷ The incongruous addition of the words “at least” were added by the PC upon the request of the AGA (sub. 13) and AGL(sub. 32). See Productivity Commission (2003), p.211.

PC seeks to broaden the interpretation of what an appropriate rate of return might encompass for service providers, even if this adds complexity, but seeks to prune the “pro-consumer” interpretations of the overall “objects clause” on the grounds that these concepts are subsumed within “efficiency.” BHP Billiton maintains that the proper meaning of the PC’s proposed Recommendation 7.1(a) are already subsumed in the current Sec. 8.1(a).

Section 8.1 (b) and (c)

BHP Billiton is also concerned that the current Gas Code’s section 8.1(b) and (c) are not addressed in the pricing principles proposed by the PC. Section 8.1(b) notes that access pricing should seek to “replicate the outcome of a competitive market.” This section is based on the efficiency “outcomes” that are contained in the overarching “objects clause.” It does not assume that the structure of a competitive market should be achieved, or that the outcomes of a “perfectly competitive market” should be replicated. Consumers will be interested in replicating the outcome of a competitive market, but monopoly service providers will not. The PC has chosen not to include the sentiments of this section. Similarly, the PC has omitted reference to “ensuring safe and reliable operation of the Pipeline” (Section 8.1(c)). There is no reason why the access pricing principles should exclude this aspect, although it too could be subsumed under Sec. 8.1(a) in the “recovery of efficient costs.”

Section 8.1 (d)

Section 8.1(d) under the Gas Code requires that access pricing not distort investment decisions in Pipeline transportation systems or in upstream and downstream industries . As we have seen from the “pro-pipeline investment” stance of the PC’s proposed objects clause, the PC has eliminated reference to investment outcomes in the upstream gas exploration/production sector and the downstream sector. The PC’s proposed specific reference to not allowing a “vertically integrated service provider to set terms and conditions that disadvantage competitors of associated businesses” is more complex and more restrictive than the current wording of section 8.1(d). The current wording has wider application than the PC’s proposal, and is supported by BHP Billiton.

Section 8.1 (e)

Pricing flexibility in the level and structure of tariffs to meet market requirements is already applied under section 8.1(e) of the current Gas Code. The driving force is “efficiency”, which BHP Billiton agrees should be a central element of the overarching objects clause. The wording suggested by the PC could be open to

abuse in the vertically integrated market structure characterising much of the Australian industry. BHP Billiton is therefore opposed to the PC's suggested wording of its clause (b)(i) of recommendation 7.1.

Section 8.1 (f)

The PC's subsection (c) of its recommendation 7.1 correlates with the Code's section (f) respectively. BHP Billiton has no concerns about the wording of this subsection and would recommend that it be substituted in the relevant part of Sec. 8.1 of the Code.

PC's Recommendation 7.1 yields undesirable flexibility to vertically integrated operations

It is the *combination* of the PC's Draft recommendations 7.1 (a)(iii), (b)(i) and (b)(ii) that provides flexibility to vertically integrated firms in the gas industry to exercise even greater control over the allocation of revenue in the supply chain. Section 8.1 (b), (d) and (e) provides a more effective constraint over such activities. In particular, BHP Billiton is concerned that the PC's proposals will provide vertically integrated companies with the flexibility and incentive to move away from tariffs that reflect user-pays on a fully distributed costed basis to a structure that is designed to over-recover and under-recover from various customers within segments. The PC's Draft recommendation 7.1 would conflict with existing sections (8.38-8.44) and of the Code, which allow for differential allocation of revenue (costs) between services and allow for prudent discounts according to the tests of being both "efficient" and "fair and reasonable"

Box 5.3: The PC's Proposed Dilution of Section 8.1 of the Gas Code

Current Gas Code Sec. 8.1	PC Draft Recommendation 7.1	BHP Billiton's Comments
<p>A Reference Tariff and reference Tariff Policy should be designed with a view to achieving the following objectives:</p> <p>(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.</p> <p>(b) replicating the outcome of a competitive market.</p> <p>(c) ensuring the safe and reliable operation of the Pipeline.</p> <p>(d) not distorting investment decisions in Pipeline transportation systems or in upstream and downstream industries.</p> <p>(e) efficiency in the level and structure of the Reference Tariff.</p> <p>(f) providing an incentive to the Service Provider to reduce costs and to develop the market for Reference and other Services.</p>	<p>The relevant regulator must have regard to the following principles when approving a reference tariff or reference tariff policy:</p> <p>(a) that reference tariffs should:</p> <p>(i) be set so as to generate expected revenue across a service provider's regulated services that is at least sufficient to meet the efficient long-run costs of providing access to those services.</p> <p>(ii) include a return on investment commensurate with the regulatory and commercial risks involved.</p> <p>(iii) generate revenue from each service that at least covers the directly attributable or incremental costs of providing the service.</p> <p>Not addressed</p> <p>Not addressed</p> <p>(b) That reference tariff structures should:</p> <p>(ii) not allow a vertically integrated service provider to set terms and conditions that disadvantage competitors of associated businesses in upstream or downstream markets, except to the extent that the cost of providing access to these competitors is higher.</p> <p>(b)(i) allow multi part pricing and price discrimination when it aids efficiency</p> <p>(c) that reference tariffs should be set so as to provide incentives to reduce costs or otherwise improve productivity.</p>	<p>The Gas Code recognises that even regulated businesses are subject to a probability distribution of outcomes and returns cannot be guaranteed as this would impose insurance costs on consumers and taxpayers. Efficient costs include an appropriate return on investment and of capital to the service provider.</p> <p>The PC Draft recommendation is unworkable as a regulatory commitment to generate "expected" revenue (probabilistic) that is "at least sufficient" (certain) or "at least covers" (certain) is inconsistent and illogical.</p> <p>The "outcomes" rather than the "structure" of a competitive market are important, and are consistent with the high-level "efficiency" objective.</p> <p>Reference tariffs should be consistent with safe and reliable operation of the pipeline.</p> <p>Whilst the PC's proposed objects clause seeks to "promote" investment in pipeline transportation, the principle of not distorting investment "upstream" and further "downstream" is lost.</p> <p>The PC's suggested wording is more complex and more restrictive relative to the current wording of s.8.1(d). It is rejected by BHPB.</p> <p>The PC's wording is potentially open to abuse in a vertically integrated market structure. BHPB rejects the PC's suggestion, preferring the original wording in S.8.1(e)</p> <p>These are essentially the same. This sub-section illustrates that the Code provides for incentive regulation so service providers can earn more than the recovery of efficient costs. The PC's suggested wording could be applied.</p>

Implications of PC's Access Principles for sections 2.24, 8.2-8.49 are not spelled out

A disconcerting feature of the PC's discussion of access arrangements, is the fact that the specific implications of the PC's proposed wording of section 8.1 for the wording of sections 8.2-8.49 of the existing Code is not set out in any recommendation. Throughout its chapter 7, the PC's Draft report denudes the building blocks framework underlying the practical application of the current regulatory framework under the Code. The PC also goes to great lengths to emphasise the uncertainty associated with estimating efficient revenue targets and in estimating the cost of equity capital. According to the PC, "implementing the WACC/CAPM approach is not a precise science," yet a practical alternative approach is not recommended. The PC's discussion creates uncertainty.

BHP Billiton can state categorically that it is opposed to any changes to sections 8.2-8.49 and section 2.24 of the Code.

5.5 Conclusion

BHP Billiton is concerned that the PC's proposed restructuring of the Gas Code will undermine the original objectives of the market reforms that the National Gas Code forms a part of: an efficient and growing gas industry. Whilst agreeing in principle and with some reservations about wording, that a streamlined "objects clause" could be of benefit, BHP Billiton has specific concerns about the PC's radical proposals. In particular:

- The proposal for separate regulatory treatment of "substantial" vs. "material" competitive benefits is likely to invite confusion on legal and economic grounds, and has already been labelled as potentially unworkable by a leading law firm;
- The proposal for "monitoring" of situations in which only "material" benefits are perceived is likely to be ineffective, as demonstrated by the recent 63% rise in airport charges following the introduction of a similar approach; and,
- The proposal to restrict the discretion of the regulator in balancing investor and customer interests by making inappropriate adjustments to Section 8.1 of the Code. The suggested substitute words "at least" are superfluous and inconsistent with the uncertainty facing even regulated companies. Utilities should be provided with the opportunity to cover efficient costs, as well as the opportunity to earn more through superior efficient operations. These principles are already incorporated in the current section 8.1 of the Code.
- The PC's recommendation 7.1 yields undesirable flexibility to vertically integrated operations and is at odds with the existing Code's sections 8.34-8.44.
- BHP Billiton is concerned that the specific implications of the PC's proposed Access Principles for sections 2.24 and 8.2-8.49 of the Code are not spelled out. BHP Billiton is opposed to any substantive changes to any of these sections.

Chapter 6

Conclusion: The Gas Code Works

1. The PC's Draft recommendations are unnecessary, potentially costly and unworkable

BHP Billiton is concerned that the Productivity Commission (PC) is un-necessarily seeking to fix a problem that it has provided no evidence actually exists; namely, that the National Gas Code (the Code) is distorting or otherwise impeding pipeline investment. Its main draft recommendations are un-necessary, potentially costly and unworkable. They favour pipeline investors over the balanced approach inherent in the Code as it is currently drafted. The PC's approach, if adopted, would raise the risk of a long term increase in delivered gas prices above those of an efficient supply chain.

2. Why cost-based access regulation is needed

The characteristics of the gas pipeline transportation sector are distinguished by a lack of contestability. In the upstream market, new discoveries of gas can radically alter the market structure, but this is not the case for pipelines. When pipelines wield market power they squeeze the profit margins of upstream gas suppliers, which will reduce exploration and production investment. The problems are compounded by the presence of vertically integrated operations. The current Code has worked well in balancing the interests of industry participants through its independence, transparency, and flexibility to changing market conditions. The failure of the National Gas Code to achieve its objectives has not been demonstrated by the PC in a rigorous and defensible manner.

3. Gas pipeline investment has not been impaired by the Code

Far from facing a “distortion” and “deterrence” due to “regulatory uncertainty”, as portrayed in media statements by gas pipeline and network interests (and repeated in the PC Draft Report), gas industry investments have out-performed the equity market. Over the past few years, Envestra, a company with relatively high exposure to the Code has out-performed the Australian Pipeline Trust, which has less exposure by a healthy margin, and has out-performed the equity market by an even larger margin. In addition, we shown that gas industry debt issues have been oversubscribed. These are not the characteristics of an industry that is hampered by regulatory uncertainty.

4. Growth means the Code is working, but pipelines still have market power

The PC argues that Australian gas pipeline markets are subject to “evolving competition.” In fact, the Australian gas industry is immature compared with the large and developed North American market. In the US, gas transmission pipelines are subject to maximum price caps set by a cost-of-service methodology. While the regulator, FERC, allows market pricing (and monitoring) when a competitive pipeline market structure can be proven, no pipeline has successfully argued the case. The US benchmark for considering a pipeline market structure for market pricing is a Herfindahl-Hirschman Index (HHI) of 1,800. In Australia, half the capital city pipeline markets exhibit an HHI of 10,000 (pure monopoly), and the other half are all well over 5,000. An indication of the market power held by Australian pipelines is provided by the fact that under the most optimistic new entry assumptions, the Sydney/Canberra markets will not reach the FERC cut-off for at least another 40 years.

The PC has undertaken no cost-benefit analysis in its Draft report to justify the de-regulation it proposes. This is contrary to practice in the US. The PC has ignored the numerous cost-benefit analyses that the NCC has undertaken as a component of its coverage/revocations decisions. Nowhere has the PC challenged and invalidated any of these cost/benefit analyses.

5. The PC’s proposed deregulation model has many shortcomings

BHP Billiton is concerned that the PC’s proposed restructuring of the Gas Code will undermine the original objectives of the market reforms that the National Gas Code forms a part of: an efficient and growing gas industry. Whilst agreeing that a streamlined “objects clause” could be of benefit, BHP Billiton has specific concerns about the PC’s more radical proposals. In particular:

- The proposal for separate regulatory treatment of “substantial” vs. “material” competitive benefits is likely to invite confusion on legal and economic grounds, and has already been labelled as potentially unworkable by a leading law firm;
- The proposal for “monitoring” of situations in which only “material” benefits are perceived is likely to be ineffective, as demonstrated by the recent 63% rise in airport charges following the introduction of a similar approach; and,
- The proposal to restrict the discretion of the regulator in balancing investor and customer interests by making inappropriate adjustments to Section 8.1 of the Code.

The suggested substitute words “at least” are superfluous and inconsistent with the uncertainty facing even regulated companies. Utilities should be provided with the opportunity to cover efficient costs, as well as the opportunity to earn more through superior efficient operations. These principles are already incorporated in the current section 8.1 of the Code.

- The PC’s recommendation 7.1 yields undesirable flexibility to vertically integrated operations and is at odds with the existing Code’s sections 8.34-8.44.
- BHP Billiton is also concerned that the specific implications of the PC’s proposed Access Principles for sections 2.24 and 8.2-8.49 of the Code are not spelled out. BHP Billiton is opposed to any substantive changes to any of these sections.

Appendix A

Herfindahl-Hirschman Index

The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers. For example, for a market consisting of four firms with shares of thirty, twenty, and twenty percent, the HHI is 2600 ($30^2 + 30^2 + 20^2 + 20^2 = 2,600$). The HHI takes into account the relative size and distribution of the firms in a market and approaches zero when a market consists of a large number of firms of relatively equal size. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases.

Markets in which the HHI is between 1000 and 1800 points are considered moderately concentrated, and those in which the HHI is in excess of 1800 points are considered to be highly concentrated.