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Black Coal Inquiry Draft Report - Asia Pacific Strategy Pty Ltd (Qld) Comments :
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Summary:
The conclusions and policy recommendations expressed in this draft report are based on macro-econometric modelling studies which are seriously flawed in two respects:

1. The Monash-Coal macro-econometric model suffers from a structural limitation preventing separate treatment of the Asian and European importing regions. This is a most serious modelling limitation for a low value add commodity such as coal, as it prevents consideration of the bilateral monopoly aspects of regional market behaviour, and regard for the cartel purchasing practices of Japanese buyers which strongly influence market outcomes in the Asian region.

2. The draft report assumes world price elasticities of demand for Australian coal exports which are an order of magnitude greater than those which are supported by econometric modelling or other academically ratified research.

Until the Monash model is modified to allow separate consideration of at least the two principal world importing regions, and forecast elasticity values can be developed for these regions which are validated by appropriate econometric or other studies, findings of the Black Coal Inquiry will remain impugned.

Detailed Comments:
Volume 1 - Section 2.1 p.12
Comment:
Reference is made in the third paragraph to *'high-cost'* mines being developed in Canada in the mid-1970s. This assertion is not correct. The first generation of western Canadian mines, Fording, Luscar, Smoky River, and Balmer (now Elkview), which were developed in the early 70s, were then and continue to be competitive on a quality adjusted cif basis in Japan with the Utah (now BHP) mines developed in Queensland in that same time frame.

Volume 1 - Section 2.3.4 pp 25-28.
Comment:
Reference is made on p.27 second paragraph to ABARE 1993, and findings that coal quality differences account for cif value differences in the Japanese coking coal market. The position taken in ABARE 1993 p.41 is based on findings from a hedonic modelling study by Porter et. al., 1990. This study pooled brand quality data from Australia, Canada, USA, South Africa, and China, for the years 1985, 1986, 1987 and 1988, to investigate the effects of coal quality on settlement price in the Japanese coking coal market. Findings differ significantly from those reported in Koerner 1993 p.75. The reason seems due primarily to differences in quality variable specification used for the two studies. Porter's study introduced coal lump size and crucible swelling number (CSN) as two key independent variables, which their results suggest are significant in explaining price differences between individual brands.

A finding that contract price is positively related to lump size, and that lump size is a significant explanatory factor for fob price, is surprising. I am not aware of technical reasoning which suggests that coal lump size is a quality characteristic likely to influence the value of a particular brand to coke makers. Model specification problems also exist with the study's inclusion of CSN as the appropriate parameter for valuation of a coking brand's caking qualities. The CSN value is derived from an unrestrained button test, and is a very crude measure of caking property whose only redeeming feature it that is a widely quoted in trade literature. Miyazu et al 1980 p.6-3, in describing the approach used by JSM coke oven operators for quality evaluation of different coal brands used in the coke blend, state: *'CSN is not suitable for the comparison of the caking property between different kinds of coal because a higher value does not always mean a higher caking property'* . The technical merit of this position is confirmed by Kahraman et al. 1997 p.4. who state : *'there is no direct link between the real performance of the coals in coking process and the (CSN) test numbers'*.

Specification problems also result from the pooling of data from 13 semi-coking brands with the premium brands considered in the study, without demonstrating by structural testing that such pooling is suggested. Finally, sampling bias exists in the data which are used for the study. Eleven soft premium brands are included, without also considering Japanese domestic soft coal brands making up a substantial portion of JSM coal purchases during the time frame considered. These are significant model specification and data bias related issues which impugn the validity of recommendations made in ABARE 1993, and later citations included in the Taylor Report p.89.

On p. 27, BHP's opinion is cited regarding the reasons behind JSM support of Canadian mine developments in the 1980s.
Comment:
BHP's 'Market Perception - Reliability' is one interpretation of the prime motive behind the JSM's support of development of the Quintette, Bullmoose, Gregg River, Line Creek and Greenhills coking coal mines in western Canada in the early 80's. However it ignores the fact that Japanese supply diversification policies designed to encourage Canadian supplies in parallel with Australian were discussed much earlier, when Moura and the Utah mines were being developed in Queensland. This sequence of developments, with supporting citations, is described in Asia Pacific Strategy Submission #50 pp.36-46, from Koerner 1991.

Japanese diversification policies, revealed as early as 1967 (see Horie 1969, pp.1-4 and p.41), involved plans to encourage coking coal supplies from the USA, Australia, and Canada., as three major supply sources with each providing about 20 million tonnes annually. In the early eighties new coking coal export capacity was developed in Queensland (i.e. Gregory, German Creek, Oaky Creek and Curragh). JSM encouragement of expansions in Canada was consistent with what had occurred in the early 70's, and line with diversification policies reported in Horie, 1969. There seems little basis to attribute the reason solely to supply security concerns, as suggested by BHP, although these may well have been a factor.

Camberwell Coal's anecdotal statement of p.25 and p.27, regarding recent sales of their semi-soft brands to individual mills at different prices, cannot be reasonably be taken as rebuttal of the work of Anderson 1987, ABARE 1998b, Beeson 1995, Byrnes 1994, D'Cruz 1979, Dowing 1987, McIntosh-Baring 1993, and Szabo 1985, who separately report evidence of patterns of price discrimination in the Japanese coking coal market over the last 30 years. Endemic price discrimination is also suggested from the hedonic modelling study findings reported in Koerner 1991, 1993, 1996 and 1998-pending. Such behaviour is even acknowledged in BHP Submission #34 p.3, which states: *'Australian and BHP in particular have had access to greater (JSM) market share limited despite delivering quality coals on lower delivered cost bases than say, US coals'* .

More revealing than Camberwell's anecdotal evidence are the events surrounding relief of BHP's export levy of $A3.50 per tonne in late 1992, and the subsequent 1993 coking coal settlement. In January 1993, Australian exporters accepted a price reduction of $US 2 ($A2.95) per tonne for premium brands, suggesting the JSM's capture of some 84% of the export levy relief which was also BHP's cost reduction. No increase in market share ensued, and hedonic modelling suggests that Australian premium coking coals were already lower by some $A 5.80 per tonne in cif cost than comparable American brands on a quality adjusted basis (Koerner 1996 p.6).

Shell and ARCO were the first to agree to the price reduction and were rewarded by increased sales volumes (see International Coal Report 25th January 1993 p.4), but BHP with reduced costs of $A3.50 was quick to follow, probably for fear of being punished by the JSM cartel if perceived as uncooperative. The overall effect was diversion of the export levy, previously retained as portion of Australia's producer surplus, to Japanese interests. An announcement by the Queensland Government that the profit component of rail freights are to be reduced under a new rail freight agreement with BHP must be viewed with some alarm, given this experience with the granting of export levy relief.

Recent articles by Swann et. al. 1998, and McLean 1996, provide little encouragement that abandonment of benchmarking by JSM negotiators will significantly alter such patterns of price discrimination, or reduce JSM bargaining power. Indeed, attempts in the new *'fair pricing system'* to eliminate what little transparency which used exist by withholding individual contract settlements as *'company confidential'* , seems likely to exacerbate future buyer distortion of this market. Collective behaviour when bargaining with foreigners is a culturally driven aspect of Japanese business strategy unlikely to disappear with the abandonment of benchmarking.

The ABARE 1997h quotation '*Japan tends to pay a price premium for thermal coal but not for metallurgical coal',* appearing at the top of p.28, supports results suggested by the econometric modelling study for thermal coal shown in Asia Pacific Strategy #38 p.11. However the fact that modelling suggests that Japanese utility purchasers pay premium prices for American and Australian thermal coals, which are not be related to quality, cannot be interpreted as demonstration of a failure to take advantage of potential market power. Rather it is demonstration that, in the case of thermal coal, Australia is presently benefiting from price discrimination. Japanese domestic thermal coal producers also benefit to the tune of about $US150 per tonne over all foreign suppliers in the Japanese utility market. Hedonic modelling of the 1992 and 1995 Chubu thermal coal settlements suggests that producers from Indonesia, and to a lesser extent South Africa and China, suffer from the price discrimination in this market.

A difficulty created by Japan's supply diversity policies, when combined with cartel purchasing arrangements, is the lessening of demand side competition for Australia's coal exports. This in turn exacerbates destructive competition amongst Australian suppliers attempting to gain sales volume in this, the largest regional market. Econometric modelling suggests this has long been the problem with Japan's metallurgical coal market. The ABARE 1997h citation does little to allay such concerns. Surely, restraint of demand side competition implicit in the well documented purchasing cartel arrangements for both utility and coking coal markets in Japan, is evidence of uncompetitive market behaviour. As Anderson 1987, pp.185-186, observes: *'the JSM's coking coal procurement policies have simultaneously achieved supply diversification and internationally competitive cost objectives in apparent defiance of the predictions of economic theory'*. This was certainly the situation at least until the mid 80's. It seems the result of a refusal, perhaps because of the Anglo-Saxon business cultural bias of most Australian stakeholders, to admit to distortions which econometric modelling studies suggest exist in Japanese coal markets.

Use of selective and inappropriate citations to support the position presently taken in Section 2.3.4 p.28 second paragraph, that Japan's desire for supply diversity justifies cartel purchasing policies, and this '*is not in itself evidence of an uncompetitive market',* is a superficial dismissal of considerable micro-economic and econometric research suggesting substantial diversion of Australia's producer surplus in the past. It creates an impression that the Commission is focussing on the sectoral interests of mine developers, rather than the goal of maximising Australia's economic surplus from coal exports in the long run, which is surely the principal objective of this inquiry..

Volume 2 - Appendix B Section B4.2 p.B13.
Comment:
The statement that 'semi-soft coals are similar to soft coking coals but have a higher ash content' is correct for most NSW semi-soft brands, but it is not the case for a number of Queensland's semi-weaker/hard brands. In volume terms, the bulk of Australian coals sold to the JSM as semi-coking are in fact higher ash premium hard coking coals from Queensland. Hedonic modelling suggests this coal is sold at significantly discounted prices which are not related to quality differences (Asia Pacific Strategy #38 pp.5-6, and Asia Pacific Strategy #1 - Koerner 1998-pending pp.3-4).

Appendix L1 Table L1.2 p.L52.
Comment:
The ABARE base case forecast for Australia's future thermal coal price trend indicates compound price reductions of less than 2% annually in real $US terms over the next decade. Hedonic modelling of the 1992 and 1995 Chubu settlements, suggests that Australian and American thermal coal prices

are not presently competitive on a cif value basis with other suppliers such as Indonesia, South Africa, and China.
Australia is a swing supplier of thermal coal to Europe, and faces stiff competition from South Africa, Colombia, and America. Given the fact that American thermal coal exporters to Europe have achieved average compound annual real price reductions of 4.7% over the decade from 1987 to 1996, the ABARE forecast of <2% seems insufficient to retain market share in Europe. Econometric modelling described in Koerner et al 1995 p. 662-664, suggests that price reductions for US thermal coals exported to Europe can be closely associated with continuing reductions in real price for low sulfur thermal coals produced from large scale open cut mines developed in the Powder River Basin since the first oil shock. Competition from these producers in domestic power utility markets previously served by Appalachian thermal coal suppliers places continued downward pressure on the US thermal export price. No evidence as yet suggests that these pressures are likely to abate in future.

Appendix L1 p.L7
Comment:
Box L2 shows the world market model configuration used in the Monash - Coal macro -econometric model used to evaluate the impact on the Australian economy of various scenarios for an industry which is export driven. The model cannot consider the regional aspects of world coal market behaviour.
This limitation makes it impossible to simulate the bilateral monopoly aspects of coal market behaviour discussed by Smith (1977). As a result the model is incapable of reflecting the realities of world market behaviour and cannot consider the impact of purchasing policies practiced by the world's largest importer of coking and thermal coals, which also dominates market outcomes in our region.

Appendix L.5 - Export demand elasticities.
Summary Comment:
No convincing basis is presented in Appendix L5 to support the Commission's adoption of the value of -10 used for Australia's coking coal world elasticity of demand, and -20 for thermal coal world elasticity of demand, used for the Monash-Coal macro-economic studies.
Discussion:
Australia is the dominant coking coal supplier to Asia providing 49.9% of imports to the region in 1996. Asia is also the world's largest importing region (61% of seaborne trade in 1996). However Australia is the swing coking coal supplier into Europe (23.8% of world imports in 1996), and US Appalachian exporters are the dominant suppliers to this market. Japan is by far the world's largest importer of coking coal with 41.5% of world seaborne trade in 1996, and annual settlements with JSM buyers usually set ceiling fob prices for Australian coking coals world wide.

Australian suppliers normally face an ocean freight disadvantage vis-a-vis US exporters in European markets of about $US5 per tonne. These buyers are well aware that, providing Australian fob prices do not fall not more than $US5 below the JSM settlement value, their offers will be competitive with most Asian importers and Australian producers will wish to supply the European market. So, in effect, the JSM settlement fob price sets a world ceiling price for Australia's coking coal exporters when the seaborne coking coal trade is in oversupply, which seems generally to be the case. Findings of econometric studies reported in ABARE 1998b, suggesting an all consumer oligopsony situation in 1996, support the regional bargaining relationships described above.

Because of buyer power and world dominance of the JSM as an importer, and Australia's large market share and competitive cif value in this market, one would expect our coking coal demand elasticity to be small. Ball and Loncar (ABARE 1991), and other econometric studies (Koerner, 1996, submitted to the Inquiry as Asia Pacific Strategy #1 pp.9-10, and Koerner 1991 submitted as Asia Pacific Strategy #50 pp 46-57), suggest that the long run demand elasticity for Australian coking coal exports to Japan is in fact zero, i.e. totally inelastic.

There is a misinterpretation of the ABARE 1991 findings in the third to last paragraph of page L84 of the draft report. Ball and Loncar are reporting mean values of demand elasticities for estimation

periods which are modelled longitudinally. In the case of Europe, this is from 1980 to 1988 using annual data, and for Japan it is from 1978(1) to 1989(3) using quarterly data. As such, the findings do not represent short run estimates, as is asserted in this paragraph.

Given the duration of these longitudinal studies (12 years for Japan, and 9 years for Europe), and findings of inelastic elasticity of demand which are confirmed for the Japanese coking coal market by Koerner,1996 pp.9-10 (20 years), there is no justification for increasing the elasticity estimates reported in Table L5.2 by 50%, as is stated in the third paragraph of page L85. The ABARE 1991p. 59 econometric findings for Japan state explicitly: *'neither own nor cross-price elasticities of demand for coking coal are significantly different from zero at the 10% level'*. These estimates suggest that the conditional demand for imported coking coal in Japan's market is highly price-inelastic-- possibly perfectly price -inelastic.

This finding is further supported by the fact that Australia's exporters have been unable to increase market share in Japan for premium coking coals since the early eighties, as affirmed by BHP Submisson #34 p.3, despite hedonic modelling studies suggesting that these coals have cif values on a quality adjusted basis significantly below that of competing US and some Canadian suppliers, (Koerner 1996 pp.5-7 , Asia Pacific Strategy Submission #38 pp.5-6 , and Asia Pacific Strategy Submission # 50 pp.14-36, from Koerner 1991). The reasons for such buyer behaviour could be attributed to some or all of the following :

1. The need for supply diversification to reduce the risk of supply disruption.
2. A desire to increase supply side competition and thereby reduce supplier power.
3. Concern over concentrations of supply side monopoly power within Australia's coal export industry (unions, rail and port services etc.).
4. Bilateral balance of trade pressures (particularly with the US).
5. Contractual obligations, particularly when Japanese financial interests have high stakes in the projects. (The Quintette and Gregg River projects each have approximately 40% Japanese equity interest).

The coking coal markets of Germany, and to a lesser extent the UK, have suffered distortion from subsidised domestic production (Asia Pacific Strategy Submission # 50 pp. 60-61, from Koerner 1991) . However, on the whole, European market behaviour has been closer to competitive. It certainly has not suffered from cartel purchasing practices of the type used by the JSM. Longitudinal econometric studies of the European market are then more likely to yield useful indications of world price elasticity of demand characteristics for Australian coking coals than are Asian markets. Inelastic demand elasticities for Australian coking coals in the range of -0.3 to -0.4 are suggested for Europe by the ABARE 1991 study.

This market is dominated by regionally competitive US suppliers demonstrating a sustained capacity to reduce their costs in real $US terms. US coking coal exporters to Europe achieved compound average annual reductions of 3% from 1986 to 1995 (Source: US EIA Coal Industry Annual - 1995, Table 102). The ABARE price forecast used in the Monash-Coal base case simulation (Table L1.2 p.L52) suggests that Australian coking coal prices will decline at an annual real rate of 2% in the next decade. If US producers continue to reduce prices at the 3% annual compound rate of the last decade, Australia is unlikely to gain market share at the expense of the US in the European or Latin American coking coal markets.

The prognosis for overall growth in future world coking coal demand is not promising. As well as the technology changes discussed in paragraph two of page L84, there is the threat of introduction of smaller scale direct smelting technology to replace the blast furnace for iron making. Such a change would affect some 80% of present world demand for metallurgical coke. Improvements in Australia's coking coal production efficiency and delivery costs are unlikely to retard the introduction of direct smelting technologies. Changes are driven primarily by the advanced age of existing coking/blast furnace facilities with increasingly stringent emission restrictions being placed on such operations in

most OECD countries, and the diseconomies of scale implicit in existing integrated plant technology (Koerner 1991 pp.157-204).

The argument used in the final paragraph p.L85 to support the Commission's elasticity estimate range is flawed. This is due to the importance of transportation in the cif cost competitiveness of a low value add commodity such as coal (see Smith, 1977). Australian exporters effectively compete only with the small proportion of world production (<12% in 1996) which enters the seaborne trade to supply end users situated at ports capable of accepting large scale bulk shipping. There is no valid argument for developing elasticity estimates using shares of Australia's production, which is mainly exported, relative to world production, which for the most part is produced and consumed locally at inland locations. For this reason the elasticity estimates shown in Table L5.3 p.L87, under the heading *Production,* are greatly overstated, and have no part in establishing meaningful range forecasts for use in the Monash-Coal scenario simulations.

The footnote on page L88 is included presumably to provide anecdotal evidence supporting the Commission's estimate of a demand elasticity of -10 for coking coal. However, use of the citation in this way is misleading and demonstrates a lack of appreciation of JSM tactics used in contract bargaining with individual Australian suppliers. McCloskey, M. editor of the International Coal Report (ICR (January 1991-264/6)) describes, in somewhat colourful language, approaches used in annual price negotiations with international suppliers as: *'All suppliers have been selling long enough to the JSM to know what happened this year is what always happens. One producer is selected from the chorus line, bribed with extra tonnage, a two year supply agreement or a reclassification of coals, enjoys an annual fling with Nippon Steel or some other stud only to be cast off 12 months later, her beauty apparently jaded. It always ends in tears.'*

Recognition of such negotiating tactics, and the fact that the supplier selected for special treatment is likely to be one with existing (or planned) excess productive capacity and low short run marginal costs, invalidates the assumption that the apparent high elasticity of demand enjoyed by MIM in this recent settlement could be applied to Australia's export industry as a whole. MIM was the first Australian producer to accept the 5% price reduction, which then flowed on to other Australian premium coal suppliers. As the reward for early acceptance, the JSM agreed to a significant term off-take increase from MIM's already committed Oaky North long-wall expansion. This is an example of the situation described by McCloskey in 1991, despite the advent of the '*fair treatment'* era of contract bargaining. It demonstrates continued application of the buyer power implicit in JSM purchasing strategies, when dealing with divided Australian exporters seeking to expand capacity in a world coking coal market which seems in perpetual over-supply.

Finally, in affirming that the -0.3 to -0.4 range for European coking coal demand elasticity seems reasonable, ABARE 1998b p.14 states :'*The elasticity assumptions that are considered most likely are the price elasticity of demand for coking coal in all import markets of -0.3'.*

The Commission's estimate of -20 as an appropriate world price elasticity of demand for Australia's thermal coals similarly lacks econometric or convincing theoretical support. Hedonic modelling of the 1992 and 1995 Chubu settlements, described in Asia Pacific Srategy #1, suggests that Australian thermal coals are not competitive on a quality adjusted cif basis with those supplied from Indonesia, South Africa and China in Japan's power utility market. In this case it seems that Australian, together with American and Japanese domestic suppliers, benefit from the price discrimination which seems implicit in Japanese purchasing practices. In such a situation our thermal coal elasticity into this, the largest market in Asia, is likely to be highly inelastic; at least until cost competitiveness is achieved.

As was the case for coking coal, the regional market most likely to be representative as far as future thermal price elasticity of demand is concerned is Europe. In Europe our exporters suffer an ocean freight disadvantage of about $US 5 per tonne, and face stiff competition from South Africa, Colombia, and America. American thermal coal exporters to Europe have achieved average compound real price reductions of 4.7% annually over the decade from 1987 to 1996 (Source: US EIA Coal Industry Annual - 1996, Table 104). The ABARE forecast of <2% for Australian prices in future (Table L1.2) seems insufficient to gain significant market share in Europe. Again however, the

best available estimates of price elasticity of demand into the European market remain those of Ball and Loncar shown in Table L5.1, of -1.21 to -1.31. The discussion on pp. L83-88 fails to provide the rationale for a forecast world elasticity which is an order of magnitude greater.

As is stated in the Inquiry's work-in-progress draft: *'it is important to use a proper estimate of the export demand elasticities because black coal exports constitute a relatively large share of Australian exports'*. The values of -10 assumed for Australia's coking coal export demand elasticity, and -20 for thermal coal, seem at least an order of magnitude greater than those which can be supported from the arguments presented and materials cited in Section L of the draft report.

Studies reported in Volume 1 pp.259-275 presently provide no legitimate basis to evaluate macro-economic implications of the scenarios discussed in the daft report. It is essential for the credibility of the Inquiry process that additional appropriate econometric modelling be performed. This is needed to enable realistic modelling which reflects differing regional market characteristics, and update the earlier findings of ABARE 1991 to develop regional elasticity values which are also realistic.

References:

ABARE (1991) 'Factors influencing the demand for Australian coal' Technical Paper 91.4, Project 4247.102.

ABARE (1997h) 'Quality adjusted prices for Australia's black coal exports' A report to DPIE Canberra.

ABARE (1998b) 'Non-competitive market behaviour in the international coking coal trade', Conference Paper 98.2, The 42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale, 19-21 January.

Anderson, D. (1987) 'An analysis of Japanese coking coal procurement policies: The Canadian and Australian experience' Centre for Resource Studies, Queen's University, Kingston, Ontario

Beeson, M. (1995) 'Australia - Japan trade relations: The coal industry as a case in point' Australian Quarterly Spring pp.67-83.

Byrnes, M. (1994) 'Australia and the Asia game' Allen & Unwin, Sydney, Chapter 3.

D'Cruz , J. (1979) 'Quasi integration in raw material markets: The overseas procurement of coking coal by the Japanese steel industry' unpublished Ph.D. dissertation Harvard University.

Dowling, G (1987) 'Buying is marketing too-Japan's influence on the Australian coal trade' Long Range Planning 20 (1) pp.35-43.

Graham,P., S.Thorpe and L.Hogan (1998) 'Non-competitive market behaviour in international coal trade' Conference paper 98.2, 42nd Annual Conference of the Australian Agricultural & Resource Economics Society, New England University, Armidale, 19-21 January.

Horie, H(ed.) (1969) Japanese Coal Manual - 1969 , The Tex Publishing Company, Tokyo.

Kahraman, H., C. Coin, and A. Reifenstein (1997) 'Technical factors determining comparative coking coal prices in the Japanese market.' ABARE Outlook '97 Proceedings.

Koerner, R (1991) 'Strategic management of an energy resource: Queensland's coking coals' unpublished Ph.D. dissertation, Graduate School of Management -The University of Queensland.

Koerner, R (1993) 'The behaviour of Pacific metallurgical coal markets: The impact of Japan's acquisition strategy on market price' Resources Policy 19 (1) pp.66-79.

Koerner, R., I. Rutledge and P. Wright (1995) 'The impact of oil company investment on the world coal industry: Overcapacity and price destabilisation' Energy Policy Vol 23 No 8 pp. 659-667.

Koerner, R (1996) 'Behaviour of Pacific energy markets: The case of the coking coal trade with Japan' Pacific Economic Paper No.252 Australia-Japan Research Centre ANU Canberra.

Koerner, R (1998 - pending) 'The influence of *sogo shosha* companies on contract bargaining in the Pacific metallurgical coal trade.' Resources Policy.

McCloskey, M (ed.) (1991) International Coal Report, January # 264 p.6.

McCloskey, M (ed.) (1993) International Coal Report, 25th January p.4.

McIntosh-Baring (1993) 'Australian Coal Industry Study' McIntosh & Company Ltd., Melbourne.

McLean, A.(1996) 'The JSM fait treatment system - fair to all?' Proceedings of the Coal Transasia Conference, Phuket Thailand - May 1996.

Miyazu, T., T.Takekawa and Y.Funabiki (May 1980) 'The selection of coal and additives for the reduction of coke cost' Proceedings of the McMaster Symposium No.8 - Blast Furnace Coke Quality, Cause and Effect - McMaster University Ontario Canada, pp.6-1 to 6-12.

Porter, D. and P. Gooday (1990) 'The Effects of Coal Quality on Japanese Coking Coal Contract Prices' Proceedings of the Conference of Economists - University of NSW Sydney. ABARE Project 5132.101.

Smith, B. (1977) 'Bilateral Monopoly and Export Price Bargaining in the Resource Goods Trade' Economic Record, Vol 53, pp. 30-50.

Swan, A., S. Thorpe, and L.Hogan (1998) 'Australia's coking coal exports to Japan: Price-quality relationships under benchmarking and fair treatment pricing' Conference paper 98.3 - 42nd Annual Conference of the Australian Agricultural & Resource Economics Society, University of New England Armidale, 19-21 January.

Szabo, P. (January 1985) 'Role of the Japanese trading company in setting world coal prices' Mining Engineering pp.31-33.

Taylor, R (ed). (1994) "Study of the Queensland and NSW black coal industry" - A report to the Australian Coal Industry Council.

US Energy Information Administration (1996) 'Coal Industry Annual - 1995'

US Energy Information Administration (1997) 'Coal Industry Annual - 1996'