

The Mutual Evolution of the Electricity and Coal Markets

Sydney Futures Exchange

Lead thought

NSW generators will find difficult competitive behaviours in the electricity market until they reduce the cost of NSW black coal to close to that of Victoria's brown coal

DISCUSSION OUTLINE

- ¶ Commodity markets evolve in recognisable patterns towards free markets
- ¶ The actual behaviour of contestants in free markets is a function of four variables
- ¶ NSW electricity producers will find it difficult to sustain satisfactory pricing because of the Victorian industries excess supply, low marginal cost and financial incentives
- ¶ Victoria's spoiling capability is based on the cost of brown coal versus NSW black coal. This exposing the inextricable linkage between coal and electricity markets
- ¶ The cost of NSW black coal could possibly be reduced by \$10-\$15 a tonne though the realisation of three strategies
- ¶ If these strategies are not realised the long term future of the NSW generating industry is at risk

Commodity markets

- ¶ Commodity markets evolve through recognisable stages towards free markets
- ¶ Outcomes at each stage of evolution are predictable

Commodity markets evolve through recognisable patterns towards free markets

Early in the development of commodity markets like oil, copper, lead, zinc, gold, silver, aluminium, there is often a high risk of market failure. There are a few buyers and few sellers, product and locational specificity may be high and capital costs are high. Because of the high risk and cost of market failure, i.e.. blackmail, early markets structures develop special power defusing mechanisms like backward ① **integration**, equity participation, and long term contracts defined in terms of volume and price. As volume grows, and trade increases, the number of buyers and sellers increases and product specificity declines, markets evolve, through ② **producer pricing** or ③ **benchmark pricing**, to ④ **liquid, free markets**

- The ①②④ pattern has happened in copper, aluminium, lead, zinc, gold.

Markets evolve through four stages

Intended outcomes of each stage are predictable

ACTUAL BEHAVIOUR IN FREE MARKETS

Actual behaviour and profitability is a function of the interplay of four variables

1. The balance of supply and demand
2. Capacity linkages and cost of transport between regional markets
3. The underlying marginal cost structures of individual competitors along with their specific utilisations

4. The managerial insight of competitors, how fast do they learn, is the learning institutionalised

NSW Electricity

Taking NSW alone, with three relatively evenly matched competitors (cost per kW/hr) one would expect the free market to allow a learning process that moved behaviour towards a point midway between position ② and ④

- ¶ However this will be difficult because of Victoria's spoiling capability. Victoria has
 - . Large amount of excess capacity
 - . Has a 1100 MW link into NSW which could be expanded (more than 10% of NSW market)
 - . Has a marginal cost of \$7 MW against about \$13 MW in NSW (\$8-9 in Queensland)
 - . Has an imperative to justify the high purchase price of generating capacity

Net net Victoria will want to pump as much electricity as possible North to NSW and probably will increase the capacity of the NSW Victoria link

VICTORIA'S SPOILING CAPABILITY

Is based on the cost of its energy source thus coal markets and electricity markets are linked

- ¶ The marginal cost of electricity is driven largely by fuel cost
- ¶ The cost of Victoria's brown coal is a function of
 - . Relative ease of extraction
 - . Scale production
 - . Moderate unions

The cost of NSW's black coal is largely driven by **export price parity** which on a K/cal basis is 2-3 times the cost of brown coal

- ¶ This exposes the inextricable linkage between coal market development and electricity market development

THREE STRATEGIES

To reduce the cost of NSW black coal by \$10-\$15 a tonne (\$250-375 million p.a)

1. Reduce dependence on export price parity coal
2. Work with the Japanese to reduce the export price through the development of a vibrant spot market
3. Work with one or more NSW producers to drive them down the scale curve sharing the gains

REDUCE DEPENDENCE ON EXPORT PRICE PARITY COAL

Basically this a medium term strategy that will reduce current costs by up to \$5 a tonne, it will require

- ¶ Purchase of non-export quality and unwashed coals
- ¶ The development of a mine spot market
- ¶ New infrastructure to allow access to a broader array of mines
- ¶ Stockpiles to avoid the risk of supply constraints

¶ Hard bargaining based on knowledge of producer costs and alternatives
Net net a stop gap, medium term, moderate impact strategy

WORK WITH THE JAPANESE TO REDUCE THE EXPORT PRICE BY MOVING TO A FREE MARKET

Japanese benchmark pricing increases cost and reduces security of supply

¶ Costs are increased by \$8-10 a tonne

Price series are different in a free market and a contracted benchmark market. Most importantly there is no “cost clean out point” in a benchmark market

- . No “cost clean out point” supports union power
- . Benchmark pricing with long term contracts lifts the cost curve in three ways
- . A free market would lower and steepen the cost curve reducing costs by \$8-10 a tonne

¶ Security of supply would be improved by a free market

A benchmark price series provides no “cost clean out point” a free market price series does

NO CLEAN OUT POINT = UNION POWER

No “cost clean out point” together with the now eroding legislated position of coal unions supports union power

¶ Costs per year growing at a much faster rate than the value of coal

¶ Much higher average earnings in coal as against other mining or industry

¶ An extraordinary strike rate

Cost per man year is increasing at a much faster rate than the value of export coal

COST OF LABOUR VERSUS COAL PRICES 1984-94

Average earnings in coal mining are over twice that of manufacturing and 50% higher than other mining industries

A COMPARISON OF AVERAGE WEEKLY EARNINGS IN THE AUSTRALIAN COAL, MINING AND MANUFACTURING INDUSTRIES 1984-94

Coal mining has an extraordinary strike rate in comparison to other industries

INDUSTRY STRIKE RATES 1984-94

Benchmark pricing with long term contracts impacts the cost curve in three ways

¶ **Low productivity** (open cut mines)

- . Hunter Valley average less than 100,000 tonnes of material moved per man year
- . Queensland average less than 150,000 tonnes per man year
- . USA over 300,000 tonnes per man year

Lame duck mines staying in the game ie high cost producers stay in production because the quantum of the benchmark price reduction is not sufficient to force closure especially as they expect a negotiated price rise next year

Large scale, low cost new entrants can't open at scale because uncontracted market is unable to absorb 10 million tonnes on day one

THE COMBINED IMPACT

Of high cost low productivity labour together with long lived lame ducks and no new large scale entrants increases costs

- ¶ Actual cost curve versus god given cost curve reflects the psychology of benchmark pricing and no "clean out point"
- ¶ This is directly evidenced by the negative correlation between "FOB Mine Gate Price" as against mine productivity

The combined effect of lower costs, higher productivity, dead ducks and new low cost scale mines lowers and steepens the cost curve

- ¶ The approximate value of this is A\$8-10 a tonne

Actual cost curve reflects psychology of benchmark pricing and no clean out point. Curve is artificially flattened and lifted

ACTUAL COST CURVE VERSUS GOD GIVEN COST CURVE

Mines with low mine gate prices are much more productive than those with high gate prices

NSW OPEN CUT COAL MINES

Total Productivity and Coal Price

Combined effects of a free market approach • lower union power , lame ducks dying f and new large scale low cost mines opening is to lower and steepen the cost curve

ACTUAL COST CURVE VERSUS GOD GIVEN COST CURVE

Security of supply would be improved by a free market as against a benchmark long term bilateral contracted market

DRIVE DOWN THE SCALE CURVE

Coal mining scale curves are a function of the nature of the ore body. Specifically OB ratio and seam thickness/separation. However at a broad level of analysis scale is critical

A 3 million tonne mine will have a cash cost of around \$25-30 a tonne, a 10 million tonne mine will have a cash cost of below \$10 a tonne

Therefore a generator could block its purchases into say one 5 million tonne block, bringing a specific mine well down the scale curve and share the gains

- ¶ This strategy is strongly influenced by what is happening in strategy 2

IN CONCLUSION

If NSW does not reduce the cost of its fuel to close to that of Victoria and Queensland, the future of NSW generating companies will be put at risk as

Victoria funds the capital expenditure to increase the 1100 MW Victoria NSW link and Queensland eventually builds its link

Paper no. 2

Possible next steps in capturing a \$10 price reduction in thermal coal “a regular, public tender market”

INTRODUCTION

The first presentation indicated that thermal coal prices would be reduced by \$10 a tonne if free market forces were brought to bear on individual mines. Free market forces would have two effects. First they would **require** competitors to address productivity and cost of labour issues and secondly a free market would facilitate the consolidation of existing mines or the opening of new mines at economic scale. A ten million tonne per annum mine having a cost structure less than half that of a three to four million tonne mine.

However, moving from a benchmark buying system to a free market is a big step. It would require a fundamental shift in the way coal purchasing is currently done and could impact security of supply. What is required is a process that allows the evolution of a free market without increased exposure to supply risk.

One approach for consideration could be the development of a regular and public tender market in which all major Japanese producers participated at increasing levels of volume

CONTENTS

- ¶ **Free market forces** would reduce thermal coal costs by \$10 a tonne
- ¶ Moving from a benchmark market to a free market is initially **too big a step**
- ¶ Criteria for a **successful transition** step
- ¶ A low risk approach to consider “**a regular public tender market**” which as it grows would become in effect a free market

FREE MARKET FORCES = \$10 A TONNE

COST REDUCTION

In summary; a free market in thermal coal would create a free market in labour, and allow scale producers into the market

The cost impact of a free market in labour would be to reduce the current average labour cost per tonne of about AUD\$10-14 to around \$3-5 per tonne

- . Unit cost per employee would approximately halve
- . Labour productivity would more than double

Mining cost is very scale sensitive a three million tonne per annum mine even with good productivity will have mine gate costs in the range of \$15-25 per tonne. A ten million tonne mine will have mine gate costs of less than \$10 a tonne. Freeing up sales from long term contracts would allow scale mines to be developed or consolidated from existing

mines. Ultimately there would only be 10-15 large scale thermal mines in the whole of Australia

EVEN THOUGH THE PRIZE OF \$10 A TONNE IS HUG

There is also a big gap between the operation of a benchmark based market as against a free market

EVEN THOUGH THE PRIZE OF \$10 A TONNE IS HUGE (

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CRITERIA FOR A SUCCESSFUL TRANSITION

What is needed for a successful transition is a process that incrementally moves towards a “free market” so as to realise the \$10 cost reduction but at the same time

- ¶ Does not increase supply risk
- ¶ Allows skills and systems to be developed gradually
- ¶ Has a rate of change that can be managed or even reversed
- ¶ Addresses the issue of product variations as specs become more consistent

LOW RISK APPROACH, REGULAR TENDER MARKE

Taipower already publishes the result to its tenders. The Japanese power companies could together formalise a regular tender process allowing a low risk transition

- ¶ Taipower already publishes the results of its tenders Ex 9, 10, 11
- The Japanese power companies together with the EPDC could do the same on a regular basis for increasing quantities of coal “a regular tender market” Ex 12
- ¶ This regular tender market would evolve over time to a free market Ex 13

The Japanese power companies and the EPDC could develop a regular tender market

THE SHAPE OF A REGULAR TENDER MARKET

EVOLUTION TOWARDS A FREE MARKET

A regular tender market would provide access to low cost high quality coal. As confidence in the process increases, power companies will be motivated to buy more high quality low cost coal and will therefore increase the volumes

- ¶ Volume increases will probably require a more sophisticated approach to

- . **Product specification** leading to standardisation of specifications
- The matching process** leading to the requirement for third party market makers or for the the prime participants to trade among themselves
- . **Information** leading to the dissemination of buying and selling intents
- ¶ In short; the motivation to reduce coal purchase costs will force the evolution of the free market place