

1. The Australian electricity markets

The South East Australian power system currently comprises four separate regions operating independent market arrangements. They are:

- Victoria, which has led Australian power sector reform with privatisation and restructuring around a power pool;
- New South Wales (NSW), which introduced an experimental pooling system as early as 1992, and in 1996 restructured its generation and distribution sector, and introduced a pool based market;
- The Snowy Mountain Hydroelectric Scheme ('Snowy'), which is owned by the Federal Government, which currently trades into both the NSW and Victorian markets through trading arrangements specific to the each recipient pool; and
- South Australia (SA), which trades with Victoria and uses Victorian pool prices as a reference for its own power transaction valuations, but does not have open market arrangements.

In addition, there is a process of 'national' market reform that aims to develop a single market across Queensland, NSW, Snowy Victoria and South Australia — the National Electricity Market (NEM). The most likely outcome from this national reform will be the amalgamation of the Victorian and NSW markets, at which stage South Australia and Queensland (when finally interconnected with NSW) will join.¹

The Australian markets that are of direct relevance to the PX and ISO formation in California are the Victorian and NSW markets. The NEM is not yet operating (although key sections of the NEM are of interest, particularly in respect of congestion), but both the Victorian and NSW markets are evolving towards the NEM. Unfortunately, neither NSW or Victorian markets have been operating very long, so it is difficult to develop firm conclusions. However, the Victorian market has a three year history, and will therefore form the main focus for discussion.

¹ Indeed, several interim market arrangements known as NEM0, NEM1 and NEM2 have been developed which define the steps for coalescence of the NSW and Victorian markets.

Table 1 Summary of Victorian and NSW electricity reforms

State	Ownership	Industry	Generation	Transmission	Distribution	Supply	Trading arrangements
VIC	Private distribution/retailing. Generation privatisation underway. High voltage transmission and system operation public	Horizontal separation of generation to station level, vertical separation of generation, transmission (PowerNet Victoria), market operator (VPX), 5 privatised distribution businesses, competition emerging from interstate retailers	Prices for wholesale electricity set in pool and by private contract negotiation. No significant generation entry restrictions. Limits imposed on cross ownership. <i>Vesting</i> contract cover declining to 2000	Open & non discriminatory access. Prices regulated by Office of Regulator General (ORG)	Accounting separation within distribution & supply business. Open & non discriminatory access to wires. Information disclosure of accounts. Price cap regulation of wires charges. Revenue based on return on assets	Maximum uniform tariffs subject to price controls and in place until 2000 for the franchise market.	VicPool III wholesale spot market. All energy traded through the pool. Establishing a joint pool with NSW (NEM 1) which may migrate to a full NEM.
NSW	All activities public.. Entry of private generation anticipated and limited new entry of retailers.	3 generators. Separation of transmission (TransGrid) from generation. Amalgamation of 25 distributors into 2 large metropolitan and 4 rural distribution/retailers.	Prices for wholesale electricity set in pool and by private contract negotiation. Declining vesting contract coverage, options for extending coverage being considered	Open & non-discriminatory access. Ring fencing of transmission and market operations. TransGrid revenue capped adjusted on CPI-X	Ring-fencing of retail and network operations of distributors. Open & non-discriminatory access to wires. Regulation of wires charges	Gross margin for the retail businesses regulated by CPI-X. Declining franchise	Competitive pool in place from March 1996; franchise market regulated. Currently establishing a joint pool with Victoria.

1.1.1 Relevant markets

In this discussion, the relevant markets are the pool (or spot market), the contract market which may include formalised short-term forward markets associated with the power exchange or pool company, and the ancillary services market.

1.1.2 Some common market features

The Victorian market and NSW market have a number of important common features:

- all are based on the *ex post* pools in which spot prices are based on the actual operation of the system rather than the *ex ante* anticipated operation of the system;
- all power is traded through the pool;
- there are no proscribed contract markets associated with either the Victorian or NSW pools. All contract transactions are essentially private. The NEM makes provision for centrally co-ordinated markets for short-term energy price hedges, but these have not been implemented in Victoria or NSW;
- both pools are based on a system of self-commitment for slow start plant. Thus generators that take more than 30 minutes to synchronise can determine their own commitment schedule;
- there are no markets for ancillary services as such. Rather, there are appropriate power to secure appropriate ancillary services. The NSW market rules make greater provisions for payments and/or charges for ancillary services than the Victorian market; and
- the pools have been based on a pool or power exchange company rather than a mutual contract between pool members (the model adopted in England and Wales).

1.2 The Victorian market

All wholesale electricity in Victoria is traded through VicPool, which started operation in July 1994. VicPool is operated by the VPX (the Victorian Power eXchange) and was established as part of the reforms taking place in the Victorian ESI.

1.2.1 Participants

There are four main classes of participants in VicPool which will continue to operate in the NEM:

- the generators;
- the distributors, who purchase electricity from the pool and sell it onto customers;
- the large customers who purchase energy from the pool to meet their own energy requirements; and
- the Traders, who deal with the historic contract obligations of the Victorian ESI prior to reform, such as Loy Yang B,² Snowy, interstate trading and the Victorian aluminium smelters.³

1.2.2 Size of market and market participants

The Victorian market is small in overall size, and individual generators are significant in terms of overall demand. For example, the larger base-load generators represent as much as 25% of peak-time capacity requirement. For example, Table 2 shows the thermal generators listed in Schedule 4 of the Victorian market rules. Table 3 shows the demand bidders. In total this comprises no more than 9,000MW of capacity in a market where peak demand is about 7,500MW.

Table 2. Generating units

Participant	Group of Units	Unit type	Units
Energy Brix	Morwell Complex	Notional Units	MOR01 MOR02
GenVic	Newport PS	Actual Generator	NPSD
	Generators 1-4 of Jeeralang A PS	Actual Generators	JLA01 JLA02 JLA03 JLA04
	Generators 1-3 of Jeeralang B PS	Actual Generators	JLB01 JLB02 JLB03

² A majority stake in the 1000 MW Loy Yang B power station was sold to the private sector prior to these Victorian reforms.

³ Electricity is supplied to Alcoa's two aluminium smelters under long-term contracts with the Government of Victoria signed in 1984, which predate these reforms.

Participant	Group of Units	Unit type	Units
Hazelwood	Generators 1-8 of Hazelwood PS	Actual Generators	HWPS1 HWPS2 HWPS3 HWPS4 HWPS5 HWPS6 HWPS7 HWPS8
Loy Yang A	Generators 1-4 of Loy Yang A PS	Actual Generators	LYA01 LYA02 LYA03 LYA04
Loy Yang B Trader	Generators 1-2 of Loy Yang B PS	Actual Generators	LYB01 LYB02
Snowy Trader	Victorian Snowy Entitlement	Notional Units	SWV1 SWV2 SWV3 SWV4 SWV5 SWV6
	Victorian Hume Entitlement	Notional Units	HUME
Southern Hydro	Combined output from Dartmouth, Eildon, West Kiewa, Clover and McKay.	Notional Units	SHLA SHLB SHLC SHLD SHLE SHLF
	Combined output from Rubicon and Cairn Curran	Notional Unit	RCC
Yallourn Energy	Generators 1-4 of Yallourn W PS	Actual Generators	YWPS1 YWPS2 YWPS3 YWPS4

Table 3. Demand bidders

Participant	Group of Units	Unit	Units
Smelter Trader	Potlines of Alcoa Portland Smelter	Actual potlines	APD01 APD02
	Potlines of Pt Henry Smelter	Actual potlines	PTH01 PTH02 PTH03
Snowy Trader	Victorian Entitlement of Tumut pumping	Notional Unit	T3PMP
	Victorian Entitlement of Jindabyne pumping	Notional Unit	JNPMP

1.2.3 Administration

The pool is administered by the Victorian Power Exchange (VPX). VPX is a statutory authority, although the Government has not ruled out privatising VPX at some stage in the future. VPX has two main areas of responsibility:

- **market operator:** operating and administering VicPool, including controlling dispatch to ensure generation meets demand, and providing information to market participants; and
- **high voltage network:** ensuring that system security is maintained at an appropriate level; operating the transmission system, and planning the augmentation of the high voltage network (which is owned by PowerNet Victoria (PNV)).

1.2.4 Bidding, commitment and dispatch

VicPool is an ex-post pool which operates broadly in the same way as the proposed NEM:

- generators and demand side bidders submit bids to VPX, specifying a price for each quantity - these bids are then stacked in merit order;
- demand is estimated, and plant is scheduled to meet demand;
- checks are made to ensure that system security is not being violated, and generators are instructed accordingly in the provision of ancillary services such as reserve and reactive power; and
- generators are dispatched to provide active power to meet demand.

The structure of the bids

The information relating to generator bids is shown in Table 4 taken from the VicPool Rules, Amendment 21. The bid structure is essentially the same as the proposed NEM bid structure.

Table 4. Information in relation to generating units⁴

Quantity	SI Unit	Value is applicable ¹ for the	Permitted Range of Value
Unit ID		Unit	Designated code for unit
Self-Commitment Flag		Day	ON or OFF
Elbow 1	MW	Day	0-10,000
Elbow 2	MW	Day	Elbow 1 to 10,000 ³
Elbow 3	MW	Day	Elbow 2 to 10,000 ³
Elbow 4	MW	Day	Elbow 3 to 10,000 ³
Elbow 5	MW	Day	Elbow 4 to 10,000 ³
Elbow 6	MW	Day	Elbow 5 to 10,000 ³
Elbow 7	MW	Day	Elbow 6 to 10,000 ³
Elbow 8	MW	Day	Elbow 7 to 10,000 ³
Elbow 9	MW	Day	Elbow 8 to 10,000 ³
Incremental Price 1	\$/MWh	Day	0 to VoLL
Incremental Price 2	\$/MWh	Day	Incremental Price 1 to VoLL
Incremental Price 3	\$/MWh	Day	Incremental Price 2 to VoLL
Incremental Price 4	\$/MWh	Day	Incremental Price 3 to VoLL

⁴ Source: VicPool Rules Amendment 21

Quantity	SI Unit	Value is applicable ¹ for the	Permitted Range of Value
Incremental Price 5	\$/MWh	Day	Incremental Price 4 to VoLL
Incremental Price 6	\$/MWh	Day	Incremental Price 5 to VoLL
Incremental Price 7	\$/MWh	Day	Incremental Price 6 to VoLL
Incremental Price 8	\$/MWh	Day	Incremental Price 7 to VoLL
Incremental Price 9	\$/MWh	Day	Incremental Price 8 to VoLL
Incremental Price 10	\$/MWh	Day	Incremental Price 9 to VoLL
Overload Price	\$/MWh	Day	Incremental Price 10 to VoLL
Offloading Price 1	\$/MWh	Day	0 to 1,000,000
Offloading Price 2	\$/MWh	Day	Offloading Price 1 to 1,000,000
Daily Energy	MWh	Day²	0 to 100,000
Overload Band size	MW	Settlement period	0 to 10,000
Available Capacity	MW	Settlement period	0 to 10,000
Minimum Generation	MW	Settlement period	0 to available capacity
Backoff Minimum	MW	Settlement period	0 to minimum generation
Commitment Status		Settlement period	0 or 1
Inflexibility Status		Settlement period	0 or 1

Notes:

- 1 Values specified in this column as being applicable for a:
 - (a) **day** must be the same for every **settlement period** in a **day** and can be different for each **day**; and
 - (b) **settlement period** can be different for each **settlement period**.
- 2 **Daily energy** applies to the entire **day** and can be different for each **day** and can be updated in any **settlement period** of the **scheduling period**.
- 3 Subject to a **minimum band size** of the **unit**.

The pool rules allow two bids for revenue in the event that a generator is required to run below its minimum stable generation or below its backoff minimum. These bid values provide the mechanism for resolving de-commitment problems in the event that self-commitment results in excessive capacity.

Balancing

There is no need for a balancing market given the ex-post nature of the market. Prices are based on actual generation.

Re-bidding

A participant may at any time alter or update the bid/offer information in the bid/offer database in relation to one or more of its Units in respect of a settlement period which commences after the time at which the alteration or updating occurs. In altering or updating bid/offer information in the bid/offer database, a participant must act in good faith.

A participant must not alter or update:

- (a) the self-commitment flag; or
- (b) the incremental prices; or
- (c) the elbows; or
- (d) the offloading price 1; or
- (e) the offloading price 2; or
- (f) the overload price,

stated in the bid/offer database for a unit for a day after 11.00 am on the day before that day.⁵

A participant must not alter or update:

- (a) the commitment status; or
- (b) the available capacity,

stated in the bid/offer database for a unit for the settlement periods falling on a day later than 37 hours before the start of that day, except:

- (a) in order to reflect a change in availability of the unit due to an event or events beyond the reasonable control of that participant; or
- (b) in order to reflect an increase in availability of the unit due to an event which the participant could not reasonably forecast; or
- (c) in response to a change in market conditions that the participant could not reasonably foresee.

The conditions under which key components of the bid can be changed are therefore limited, reducing the scope for gaming through re-bidding. As far as we are aware, the limited ability to change bid/offer information does not cause problems in VicPool.

1.2.5 Pool rule changes

There have been four main phases of VicPool. These changes have been gradually undertaken to merge the Victorian pool rules and institutions with those proposed under NEM market rules. The latest phase is known as VicPool III enhanced, and commenced operation on 1 September 1996.

⁵ Source: VicPool Rules Amendment 21

Several important changes were made to VicPool III as part of the movement towards the NEM arrangements:

- **daily bidding:** previously generators placed weekly bids. Under VicPool III enhanced generators place daily bids with VPX;
- **increments to bids:** previously the generators were able to bid their capacity into the pool in three increments. In VicPool III enhanced generators are able to bid their capacity into the pool in 10 increments; and
- **self commitment:** previously VicPool operated on the basis of central commitment. In their bids generators were required to submit start up costs, start up times and minimum on and off times. VPX analysed the costs and times presented by each generator and took the start up and close down decisions. Under VicPool III enhanced generators are required to self-commit.

There are still several key differences between the NEM rules, and the VicPool rules currently in operation:

- **regions:** the NEM is a market with a series of regions, linked by interconnects. VicPool operates in a single region. Trade with other States is managed in the context of VicPool by the IOA Trader;
- **short term forward market (STFM):** VicPool has no STFM. To fill the price discovery role performed by the STFM in the NEM, VPX publishes seven day ahead indicative prices. The generators are required to submit to VPX indicative bids on a seven day ahead rolling basis. The generators are not required to submit actual bids related to these indicative bids. VPX then calculates and publishes indicative prices, to provide market participants with an indication of short term prices;
- **moveable elbows:** the bids for VicPool and NEM each contain 10 price capacity bands, however unlike the NEM bids, the VicPool bands do not have 'moveable elbows'. This means that the MW capacity bid into the pool cannot be sculpted by half hour. Rather the MW capacity in each band are fixed throughout the day, and only the price of each band can vary;⁶ and
- **treatment of losses:** in VicPool all customers pay a pro rata share of losses. In the NEM losses within a region are calculated with

⁶ The NSW market does include moveable capacity bands. This has caused some unexpected volatility in pool prices and may provide opportunities for gaming, although it is difficult to draw conclusions over the limited extent of operation.

regard to a reference node. Customers and generators at the same point pay and receive the same price, but customers and generators at different points will pay and receive different prices, depending on loss factors from the reference node. Under the NEM loss factors between regions will be determined dynamically.

Other changes in the pool rules

Since the inception of the market there have been a number of changes to the VicPool rules, to develop upon the initial rudimentary pooling arrangements, and to bring it more into line with the proposed NEM rules. Two main changes are of particular significance:

- a change in the structure of generator bids at the end of 1994, whereby generators were allowed to bid three capacity bands as opposed to the one band allowed to that date; and
- the foregoing move towards bidding and pool rules akin to the NEM (i.e. 10 price bands for each unit and self-commitment) in October 1996.

Hence, pools based on the self-commitment of thermal plant have only been in operation 8 months (since May 1996 in NSW and October 1996 in Victoria). It is therefore difficult to draw definitive conclusions from the experience to date.

1.2.6 Ancillary services

The generator licenses require the Victorian generators to provide ancillary services at the request of VPX. The Tariff Order limits VPX's expenditure on ancillary services to \$20 million per annum. This contrasts with expenditure on ancillary services in the NSW market of around \$80 million per annum. As a consequence generators receive payments for only a small proportion of ancillary services. Most ancillary services are undertaken by generators to accordance to with the requirements of the Code.

The ancillary services provided by each generator vary. For example, the gas turbines are typically used for black starts, while the coal stations are used for frequency control. VPX allocates the requirement to provide ancillary services in such a way that the obligation is shared evenly among the generators.

At present a major review of the provision of ancillary services in Victoria and NSW is underway, in preparation for NEM1. It is anticipated that the recommendations from the review will be implemented in July 1997, when NSW and Victoria adopt a joint system security policy.

1.3 Contracts in VicPool

There are several mechanisms for managing risks in VicPool. Generators and retailers can hedge against pool price volatility using:

- vesting contracts; and
- contestable contracts.

Generators can hedge against the risk of an outage leading to large contract liabilities under a fixed contracts under the generator coinsurance scheme.

1.3.1 Vesting contracts

Each generator in VicPool holds a vesting contract with each distributor, and the Smelter Trader. The vesting contracts were put in place on 1 July 1995. The vesting contracts cover consumption by franchise and some Tariff H customers.⁷ The MW cover under the contract declines with the reduction in the franchise market set out in Table 5 until the market becomes fully contestable in December 2000.

The vesting contracts contain two distinct types of contract cover:

- **a two way difference contract:** under the two way difference contract generators and distributors compensate one another for movements in the pool price around the strike price. The difference contract only applies at pool prices less than \$300/MWh; and
- **a one-way non-firm high SMP hedge:** under the high SMP hedge generators are required to compensate distributors for pool prices above \$300/MWh (in March 1994 dollars). The contract is non-firm because generators are only required to compensate distributors to the extent they are producing at the time. In return for this contract cover the distributors pay the generators a monthly option fee.

The distributors are covered for actual franchise and Tariff H consumption within $\pm 7.5\%$ of the forecast load. There is also a provision within the vesting contracts to vary cover should any Tariff H customers move to the contestable market. The franchise reduction is shown in Table 5.

⁷ Historically, large commercial and industrial customers were supplied under a tariff known as Tariff H. When these customers became contestable they were given the alternative of entering the contestable market, or remaining on a Tariff H safety net tariff. Those customers on the Tariff H safety net tariff were covered in the vesting contracts.

Table 5 Victorian franchise reduction strategy

Introduction of competition	Estimated number of customers affected (cumulative)	Customer load
December 1994	47	> 5MW
July 1995	377	> 1MW
July 1996	1,877	> 750MWh
July 1998	7,000	> 160MWh
December 2000	1,960,000	All customers, assuming no technical or economic constraints

Source: Office of State Owned Enterprises Department of Treasury, *Reforming Victoria's Electricity Industry December 1994* and NSW Electricity Reform Taskforce, *Retail Competition in Electricity Supply*, June 1996

1.3.2 Contestable contracts

The decline in the franchise market, set out in the threshold reduction strategy, has meant a corresponding increase in the contestable market. Most retailers have signed contestable contracts with generators in order to hedge the risks associated with supplying their contestable customers. There is no publicly available information on contestable contract terms and prices.

1.3.3 Generator coinsurance

The Victorian Government set up the generator coinsurance scheme with the intent of providing a mechanism for managing unavailability risk, enabling the generators to enter into firm contracts. The scheme commenced on 1 July 1995 and expired on 30 September 1996. All Victorian generators previously owned by the SECV were required to participate in the scheme.

The scheme acted as a mechanism to protect participants from exposure to high pool prices by sharing the revenue from high pool prices among the Victorian generators. Under the scheme, the generator who is contracting for cover pays to all other generators a premium, and those other generators compensate the contracting generator during times of high pool prices. The amount each generator contributes to the hedged generator's difference

payment varies with the electricity they sent out (and therefore the revenue they earned) during the relevant period.

In addition to the generator coinsurance scheme, the generators often signed 'back-to-back' contracts with other generators to manage their exposure to pool price at times when they were out on maintenance.

A number of schemes have been implemented since the expiry of the generator coinsurance scheme. These replacement schemes are bilateral arrangements between contract counterparties, like the back-to-back contracts, and do not involve any central co-ordination or compulsory participation like the coinsurance scheme.

1.3.4 Industry codes of practice

The licenses require industry participants to comply with industry codes and pool rules. These codes are developed by industry participants. There are a number of industry codes:

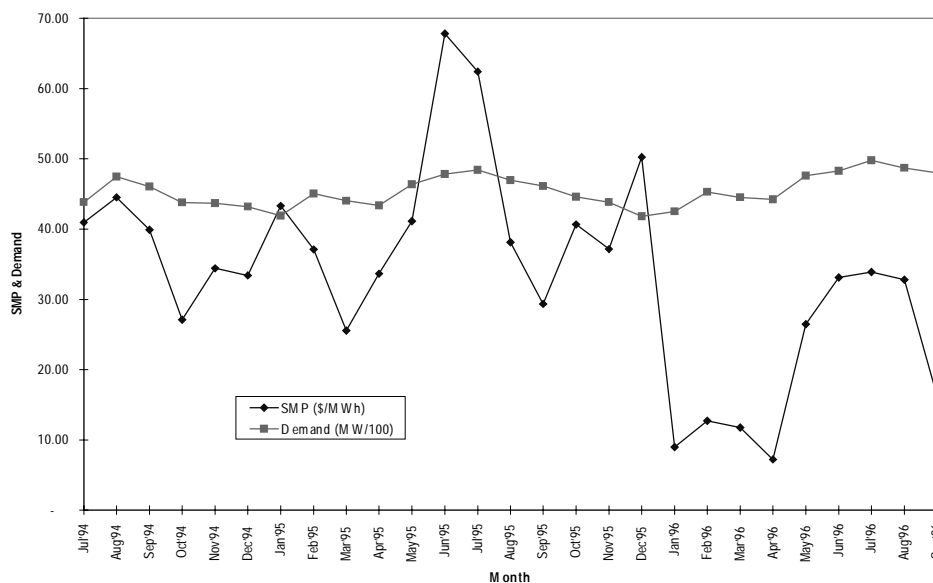
- **pool rules:** the pool rules govern the operation of the Victorian wholesale market;
- **system code:** the system code sets out the requirements for ensuring the safe and secure operation of the Victorian electricity system;
- **wholesale metering code:** the wholesale metering code is designed to ensure that electricity flows are appropriately measured in order to facilitate the trade of wholesale electricity through the pool;
- **distribution code:** The distribution code regulates the physical supply of electricity from a distributor's network and the way in which customer's installations affect the network;
- **supply and sale code:** the supply and sale code regulates the conditions under which distributors sell electricity to franchise customers; and
- **retail tariff metering code:** the retail tariff metering code governs the installation of new equipment.

1.4 History of Victorian pool prices

Figure 1 shows the monthly, time-weighted average SMP and system demand for VicPool since the market commenced in July 1994. The results show no obvious correlation between pool prices and the seasonal patterns of supply and demand, suggesting that other factors such as generator behaviour, contract cover and regulation are as important as the supply demand balance.⁸

⁸ Similarly, in the UK pool, the majority of major price movements have been caused by changes in generator behaviour or factors external to the pool such as regulatory action of the effect of fuel and hedging contracts

Figure 1. Monthly average prices and system demand in VicPool



There are clearly two phases in the life history of the Victorian market:

- the 'early' period to 1 January 1996 and the period thereafter. In the early stages of the market, prices remained consistently above \$30/MWh; indeed, in 1995 they were above \$40/MWh. These are prices above the level one would expect in a competitive market with over-supply, being close to or above new entrant prices
- the 'late' period thereafter, where prices spot fell below \$21/MWh on average, which is consistent with the observation that the market is over-supplied, so prices should be below new entrant prices.

'Early' prices

The change in market outcomes reflects significant changes in market circumstances. The early stage of the market was characterised by:

- modest over-supply particularly when one considers that opportunity exports from Victoria to more expensive neighbours were restricted in this period;
- common interests amongst the generators which were effectively under common ownership;
- public ownership;

- overall levels of contract cover in the market significantly below the level of expected demand; and
- high levels of vesting contract cover at prices of between \$35/MWh and \$40/MWh.

The net effect of these market conditions was that generators were willing to sacrifice output (in the spot or short-term market) in order to raise pool prices. Examination of the bidding patterns of generators at that time shows a remarkable degree of consistency in the bids of supposedly independent generators, such that:

- base load generators bid between 50% and 70% of their capacity at a relatively low price, but consistently bid the remainder of their capacity at prices between \$30/MWh and \$40/MWh, even though this price was well above their short-run operating cost. The bidding tended to maintain the 'natural' merit order; and
- mid-merit and peaking generators bid in accordance with the bid of the high price bands of their base-load counterparts, even though these bid prices were well above operating costs.

This was suggestive of significant degree of tacit collusion — i.e. the ability to develop common bidding strategies that sustainably increased profits for all participants above competitive levels without formal communications. The repeated nature of the bidding into the pool in combination with the information release rules provided a good environment for such an outcome. The degree of common interest was also reflected in contract prices over the period which almost universally offered identical terms as the vesting contracts.

There were other contributory factors to pool price outcomes at the time. For example:

- throughout the first year of VicPool's operation there was considerable price volatility as generators tested out the new market. The price dips in October 1994 and March 1994 are thought to be due to a degree of experimentation of this sort; and
- the winter of 1995 was unusually cold in Victoria, leading to above average demand. This increase in demand was accompanied by an unusual level of unavailability amongst the Victorian generators which led to very high prices. It is likely that some capacity gaming was taking place at this time,⁹

⁹ Capacity gaming happens when a generator deliberately makes some plant unavailable with a view to raising prices. This is more attractive to generators in

but the most compelling explanation is supra-competitive prices through tacit collusion.

‘Late’ prices

Prices fell significantly in 1996. In the lead-up to the Hazelwood sale, the Electricity Supply Industry Reform Unit (ESIRU) commissioned a review of the factors influencing the price.¹⁰ This review, which was summarised in the Hazelwood Information Memorandum, identified a number of factors which contributed to the period of low prices. The reasons cited by ESIRU were:

- **the commencement of operation of Loy Yang B Unit 2:** in January 1996 a new 500 MW unit came into full operation at Loy Yang B. This unit has a relatively low marginal cost and a high level of contract cover. It was therefore bidding most of its capacity into the pool at a low price. The early commissioning of this unit effectively left the market over-contracted. Hence, other generators were forced to lower their prices somewhat to ensure that they still covered their contract allocations;
- **gas station take or pay contracts:** the gas fired stations at Newport and Jeeralang purchase their gas under take or pay (TOP) contracts, but were well short of their minimum take quantities.¹¹ Hence, the effective marginal cost of their fuel was low. They therefore bid low to ensure their TOP quantities were utilised prior to the expiry of the contract in December 1996;
- **unusually low load:** due to a mild summer, peak demand over the period was 10% below expected values; and
- **ETSA contract:** in December 1995 the ETSA contract was allocated to Hazelwood. As a result Hazelwood changed its bidding strategy in order to ensure that sufficient capacity was dispatched to cover this requirement.

In April 1996 the Victorian government removed the TOP obligation from these generators which allowed the gas stations to resume their previous

periods of high demand when the rise in prices due to withdrawal of capacity is likely to be at its steepest.

¹⁰ *A review of the basis for recent low prices in the Victorian Electricity Market* by Hugh Bannister of Intelligent Energy Systems Pty. Ltd..

¹¹ Due to a variety of reasons including the Loy Yang B unit commissioning and mild, low demand summer.

bidding strategies;¹² This measure temporarily increased pool prices, but was not sufficient to permanently increase pool prices. One is therefore tempted to suggest that, whilst the foregoing did contribute to the fall in pool prices, the major factor was the breakdown of the market conditions that fostered tacit collusion. The major factors in this regard were:

- the addition of the 500MW of fully contracted Loy Yang B capacity; and of equal importance
- the significant change in market imperatives for the privatised generators, Yallourn and Hazelwood.

Central to this discussion is an understanding of the way in which generators bid in their contract cover into the pool. The major generators in VicPool have a high proportion of their expected generation covered by hedging contracts. This gives them an incentive to ensure they are dispatched to meet their contract commitments, particularly if they anticipate that pool prices will be low in comparison to contract prices. They therefore tend to bid in that portion of their capacity covered by contracts at close to their marginal operating costs.¹³

Yallourn and Hazelwood

Yallourn and Hazelwood were purchased on the basis of business plans predicting very high availability and capacity factors — that is, they were expected to operate at full output to supply the base-load market in Victoria and interstate. Their financing arrangements and business plans were not conducive to reduced output in order to raise pool prices. Accordingly both stations have taken aggressive positions in the wholesale contract and spot markets. This is reflected in pool prices *and* in contract prices which reputedly are well below \$30/MWh at present. Thus, contract prices are currently below vesting contract prices and below estimates of new entry costs.

It is not clear that either Hazelwood or Yallourn understood the impact of their own strategies on market outcomes, or whether their business planning

¹² That is, the Government agreed to bear the cost of failing to meet the TOP obligations set out under the contract, which should have offset the increase in base-load capacity from Loy Yang B.

¹³ Bidding below marginal operating costs could result in operating losses, particularly in Victoria which has surplus base-load capacity.

was based on earlier development of the national electricity market (NEM) than has occurred.¹⁴

Rule changes

In September 1996 prices dropped which corresponded with the commencement of VicPool III enhanced. The key change at that time was the introduction of 10 part bids and self-commitment. Some initial volatility in prices might be expected after such a change as generators varying their bidding strategies to learn how the new market arrangements influence pool prices. However prices since then have remained subdued — weekly average prices have remained low, often below \$20/MWh. And the average pool price over the whole of 1996 is only \$21/MWh.

Hence, one would tend to suggest that rule changes have been less significant a factor in causing market prices to reflect the market supply demand balance than the change in commercial imperatives that eroded the conditions for tacit collusion.

1.4.1 Conclusions

The price path in VicPool shows several important lessons:

- it is possible for the generators to influence the level of prices. For sustained periods of the time prices have been above 'competitive levels'. The repeated nature of bidding into the pool provides an environment for tacit collusion. This collusion is further facilitated by the availability of bid information to pool participants. However, this also relies upon appropriate financial and contract positions by the market participants;
- in the relatively small Victorian market the pool price is relatively sensitive to unusual or external events. For example, direct intervention on the fuel arrangements for Newport (500MW) had a significant impact on pool prices, as did the industrial action at Yallourn immediately after its sale;
- once Victoria is operating in an interstate pool the magnitude of price shocks will decrease, and market conditions that sustain tacit collusion may return;
- diversity of financial and contract positions amongst market participants

¹⁴ Access to the NSW market that contains 3 portfolio generators (under common ownership) that might be willing to sacrifice output could help to re-establish market conditions conducive to tacit collusion.

