
THE GAS MARKET FOR THE FUTURE

A Description of Victoria's
Competitive Gas Market

NOVEMBER 1997

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Introduction

“The Gas Market for the Future - A Description of Victoria’s Competitive Gas Market” has been written to assist interested parties to gain a basic understanding of the new market model. Topics in this document include: parties who may participate in the market, the Rules governing the market, the operation of the system, how the market may change, tariffs and the model for managing gas transport.

1. Reasons for Reform - The Benefits

Reform of the gas market nationally is vital to Australia to fully capture its natural advantage as a low cost energy supplier and its potential for growth. The Victorian State Government has managed a process to reform and privatise the Victorian gas industry to deliver benefits to all Victorians. The reforms will also position Victoria to maximise the benefits achieved from the introduction of competition across state borders and the development of national energy markets.

The Victorian State Government has established objectives for the reform of the gas industry. These are to:

1. Achieve the lowest sustainable gas prices for Victorian Customers;
2. Maximise Customer choice;
3. Provide a more efficient industry and encourage investment;
4. Provide the framework for effective and sustainable energy markets, integrating gas and electricity;
5. Ensure a regulatory environment that best protects Customers;
6. Ensure long term security of supply;
7. Encourage the development of an efficient national gas market; and
8. Reduce public sector debt.

The Victorian Gas Market model will help achieve these objectives by:

- Allowing market forces to determine an equilibrium price for parties who choose to enter the market;
- Providing price transparency;
- Lowering barriers to market entry;
- Allowing an efficient allocation of transmission resources; and
- Allowing Market Participants to sell gas and use alternative energy sources when demand for gas is high.

By providing price transparency, the Spot Market will provide Market Participants and potential Market Participants with market-based pricing information to assist them in making optimal production, consumption and investment decisions.

2. Why a Spot Market?

In any system, when the System Operator observes or projects that pressures in the pipeline are falling below acceptable levels, the operator must induce either more injections of gas or reduce withdrawals of gas, or a combination of the two.

Traditional Gas Transmission Systems

In the above circumstances, under the traditional North American arrangements, the System Operator might achieve this by determining which Market Participants were withdrawing more gas than they have nominated, or than they were injecting, and then persuading them to stop doing so. The System Operator may do this, possibly, by issuing operational flow orders and/or by the threat of imposing severe penalties.

Victorian Gas Transmission Systems

Compared to many gas transmission systems around the world, the Victorian system is relatively small and has limited storage capacity by way of physical linepack and a single LNG facility. It is expected that, over the next few years, there will be additional sources of gas introduced to the Victorian transmission system (including interconnection with New South Wales and underground storage). The system is thus likely to become a network, with gas injected and withdrawn at a number of points - effectively, more like a large regional distribution network than a long distance "point to point" transmission system. For some points, including interconnections and underground storage, gas could either flow into or out of the network at different times.

Competition Increases Complexity

It is generally accepted that the economics of a network are more complicated than those of a single pipeline. Where the arrangements are such that gas supply and transportation are provided by way of a "bundled service", detailed analysis of the various components of the system economics is not necessary. However, as access to transmission systems is opened up and competition in retail markets develops, such analysis will become increasingly important.

Complexity mitigated by Spot Market

The Victorian gas market has been designed to provide a framework whereby there may be many different, privately owned, parties trading over the system and interacting commercially with the monopoly pipeline and distribution systems. The Spot Market provides a mechanism by which Market Participants can trade, and thus influence, the value of gas at different points around the system at different times. In so doing, the value of gas, as determined by the Spot Market trades, will effectively solve the complex economics of the network and drive the efficient scheduling of gas flows through market forces, rather than through centralised planning or intervention.

Role of the System Operator

The System Operator, VENCORP, will receive nominations and competitive offers from Market Participants to inject or withdraw gas, and will schedule gas flows in accordance with the nominations, Market Price and quantities specified in those offers to meet system requirements in the most cost effective way. In doing so, VENCORP will determine the implied market clearing prices and manage the settlement of Spot Market trades.

System Reliability

Except under exceptional circumstances, system reliability will be maintained efficiently without VENCORP needing to take unilateral action or impose arbitrary rules or financial penalties.

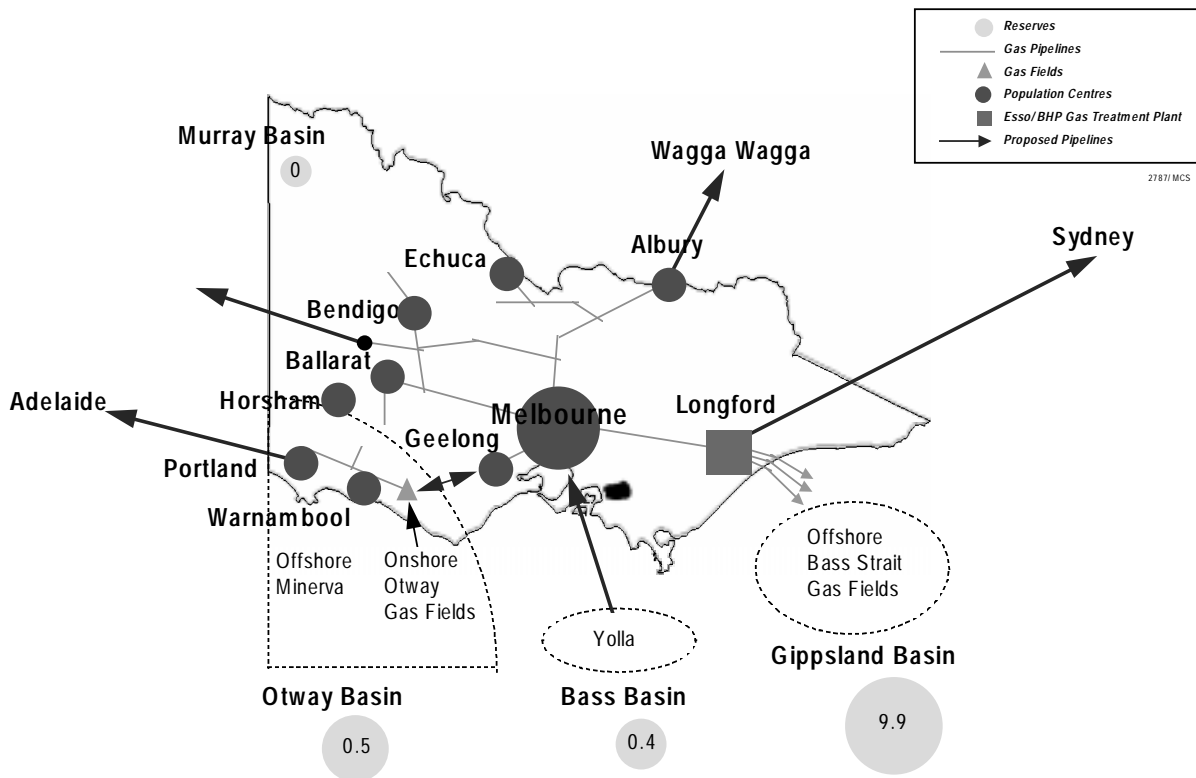
Instead, reliability will be maintained with all Market Participants paying or being paid a market based price for their actions.

3. An Overview of Victoria's Gas Market

The opportunities provided by active participation in the market will first be made available to large Customers, but will progressively become available to all Customers by 1st September 2001. Smaller Customers will continue to pay regulated retail tariffs (as they do now), until introduced to competitive retail and, where appropriate, wholesale alternatives.

While the new market structure will provide Customers with the opportunity to purchase gas on an unbundled basis it is expected that all smaller Customers, and some larger Customers, will purchase their gas as a package, from Retailers. The Retailers will pay separately for the gas, transmission charges and distribution charges, and then sell to Customers a "bundled" product of delivered gas. For the Customers who buy a bundled gas service, the description of the Gas Market is less relevant, except to the extent of understanding the alternative to a Retailer service.

Figure 3.1 - Existing and proposed gas transmission pipelines in Victoria



4. Who is Involved? - The Parties in the New Gas Market

Customers - The Customers are the end users of gas, and include residential Customers, businesses and gas-fired electricity generators. Customers are described in a variety of ways. The Customers that are able to choose which Retailer supplies them with gas are called “**Contestable Customers**”. “**Non-Contestable Customers**” are those who do not yet have a choice of which Retailer supplies them gas and are supplied gas under maximum uniform prices which are fully regulated by the Gas Tariff Order. Customers will be able to choose which Retailer supplies them gas in stages, with Retailers able to compete for the largest Customers first.

Customers, whether Contestable or not, are also described as “**Daily Metered**” (Tariff D), which means that their consumption can be measured each day (usually large gas users), and “**Non Daily Metered**” (Tariff V), which means their consumption is measured in aggregate over a longer period (usually smaller users including residential Customers).

Retailers - Energy 21, Ikon and Kinetik are the current Victorian Gas Retailers that buy gas from the Producers, transmission services from VENCORP/TPA, and distribution services from the Distributors, then sell a “bundle” of gas services to end Customers. They do not own any pipeline of their own, but rather pay the Distributors and VENCORP/TPA for use of their pipes. New entrants may apply to the ORG for a gas Retailer’s licence.

Distributors - The gas Distributors, currently **Multinet, Stratus Networks and Westar**, own the smaller pipelines that bring gas from the TPA pipeline to the end Customer. Distributors are not Market Participants.

Pipeline - Transmission Pipelines Australia (TPA) is the owner of the major gas transmission pipeline in Victoria. Transmission refers to the movement of gas from the Producer supply point to the point where the distribution network begins. TPA is not a Market Participant. NB. The Access Arrangements allow for entry of new transmission pipeline companies.

VENCORP - Victorian Energy Networks Corporation, the independent gas transmission system operator, is responsible for managing the Spot Market and balancing the physical supply and demand of gas. VENCORP coordinates the gas Spot Market, and operates the TPA transmission pipeline. VENCORP is a statutory not-for-profit service body/entity that charges on a regulated cost recovery basis for its services.

Producers - The Producers are the parties involved in drilling, extracting and processing natural gas.

Gas Storage Operators - The operators of facilities that assist to balance the transmission system by storing gas on days of low demand and injecting it into the system on days of peak demand are known as Gas Storage Operators. They include the proposed Underground Gas Storage (UGS) operator.

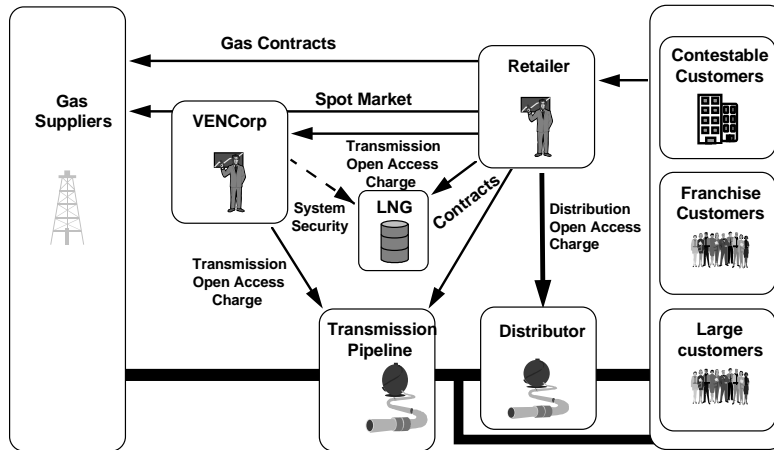


Fig. 4.1 An overview of the Key Commercial Relationships in the new Gas Market.

5. Contestability - What Choices do Customers have?

All Customers will be able to make choices about how they buy their gas by 1 September 2001. Customers will become “contestable” in four separate stages depending on their annual use of gas. Figure 5.1 illustrates the timetable for contestability.

Fig 5.1

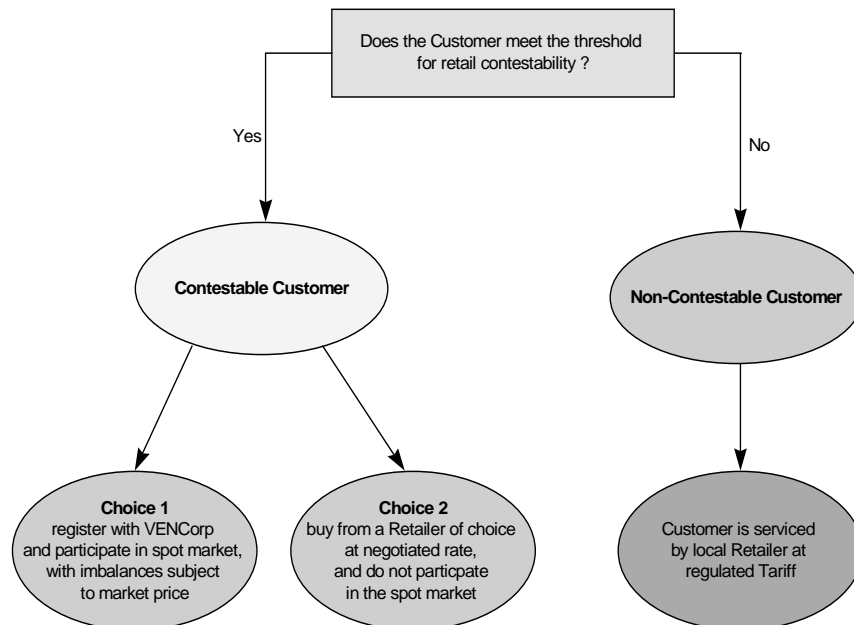
Annual Gas use ¹	>500,000 GJ	100,000-499,999 GJ	5,000-99,999 GJ	<5,000 GJ
No of Customers	35	112	1,077	1.3million
Example	Large Manufacturers	Medium Manufactures	Commercial	Domestic
	1/9/1998	1/9/1999	1/9/2000	1/9/2001



Choices at point of contestability

When they become contestable, Customers may choose to participate in the market or to purchase a bundled gas product from a Retailer.

Fig 5.2



Choice 1. Be a Spot Market Participant

Customers who choose to participate in the Spot Market will purchase their gas either through a contract with a Producer or from the Spot Market.

Participation in the Spot Market will require the management of spot market risk, separate payment for transmission and distribution services, installation of appropriate metering, registration with VENCORP and payment of relevant market fees (see Gas Tariff Order for fee schedule). While this may be worthwhile and profitable for some large Customers, the majority of Customers would be unlikely to find direct participation in the Spot Market to be cost effective.

¹ To prevent aggregation of sites the thresholds apply to individual supply points.

Choice 2. Choose a Retailer

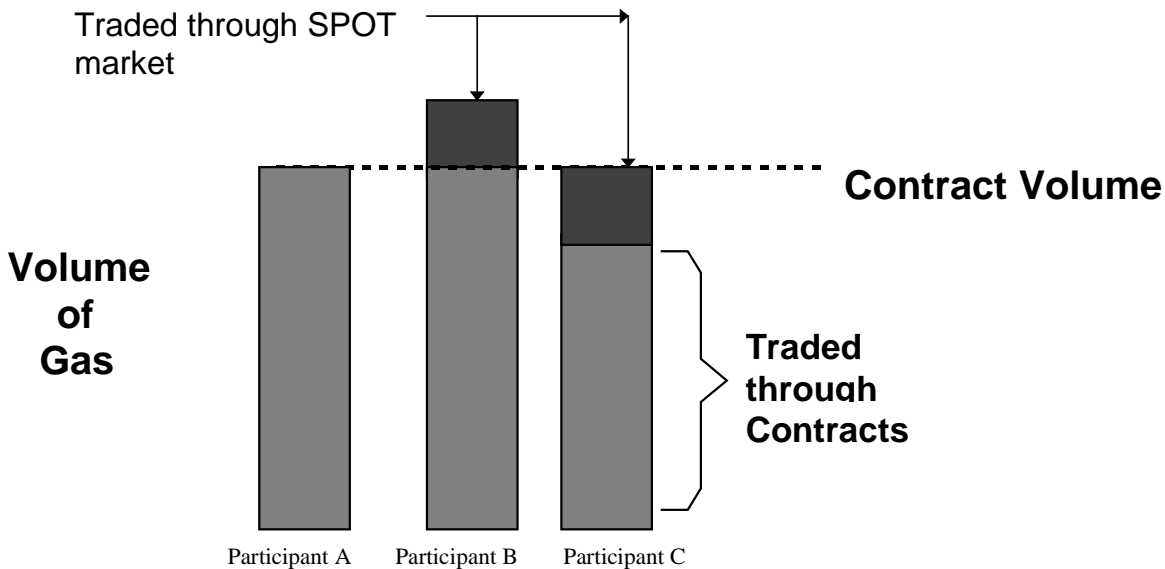
Instead of participating in the Spot Market themselves, many Customers are likely to prefer buying from a Retailer at a negotiated “all in” or bundled price, with the Retailer assuming the responsibilities and managing the risks associated with direct Market participation on their behalf.

Retailers will compete to offer contestable Customers the best bundle of services and Market Price to attract their business. The range of Retailers will include Energy 21, Ikon Energy and Kinetik Energy and any new Retailer entrants.

6. How is Gas Traded?

It is expected that most gas will be traded by contract between Producers and Retailers, and that Retailers will on-sell the gas to Customers. Parties will be free to enter into any contractual arrangement for the purchase or sale of gas that they choose. Contracts may be for any term (eg. years/months) and may allow for flexible purchase quantities (eg. daily/monthly/annual variation).

Figure 6.1



In the simplified example above, Market Participant A is withdrawing the same volume that it is injecting and is not subject to the Spot Market. Market Participant B is withdrawing more than it is injecting and is purchasing the excess volume from the Spot Market. Market Participant C is withdrawing less than it is injecting and is selling the excess into the Spot Market..

Because it is difficult for a Retailer or Market Participant to precisely forecast its demand for gas on any particular day, on most days the actual quantity of gas purchased under contract by a Retailer or Market Participant will not exactly match the quantity of gas consumed.

The Spot Market provides the means of dealing with this imbalance so that the Retailer or Market Participant pays for the excess of actual withdrawals over actual injections, or receives payment for the excess of actual injections over actual withdrawals, at a price determined by the Spot Market. To the extent that a Retailer can achieve a balance between injections and withdrawals, that Retailer can control its exposure to the Spot Market.

The Spot Market deals only with the imbalance between actual injections and withdrawals, and this imbalance will generally be small in relation to the total quantity of gas purchased or sold. Therefore it is expected initially only a small portion of gas will be traded through the Spot Market.

Gas is the only commodity that is traded in the Spot Market. There is no trade on the Spot Market in transmission system capacity. The issue of transmission system capacity is discussed in Section 8.

The design of the Spot Market allows for the possible future development of secondary markets. For example, a Short Term Forward Market could be established separately from the Spot Market if this were considered to be worthwhile.

There are two points with regard to trading that are worth highlighting:

- Parties are not required to trade on the Spot Market. If a Market Participant withdraws exactly what it injects and does not submit an offer to sell their gas, the Market Participant is not subject to the Spot Market.
- A Market Participant may buy or sell all of its gas from the Spot Market, provided there is a Market Participant willing to sell or buy.

The Spot Market is therefore a convenience for Market Participants rather than an imposition. It is available to be used as much, or as little, as a Market Participant selects.

6.1. What is the role of the Retailer ?

Retailers are the merchants of the new gas industry. The role of the Retailer is to buy gas and transmission services and to sell a package of delivered gas and related services to Customers. Retailers are free to sell a package of gas services in any area to any Customer that is contestable.

There is one major Producer of gas in Victoria, and that Producer has contracted the sale of gas to Gascor for the medium term. Gascor will on-sell to the Retailers the gas that it purchases from the Producer. The contract between Retailers and Gascor will have similar terms to the contract between Gascor and the Producer. The Retailers are actively seeking additional sources of gas supply.

Steps have been taken to ensure that there are minimal barriers to entry for new Retailers to compete with the three initial Retailers including the opportunity to secure gas through a Gas Release program coordinated by the State. It is anticipated that Retailers will diversify the products that they offer and will eventually offer both gas and electricity retailing services.

7. How Does the Spot Market Work?

The fundamental features of the Spot Market are that:

- Gas is scheduled for trading in accordance with nominations and competitive offers from Market Participants;
- Market Participants pay or are paid for their actual imbalance at a Market Price which is determined from the competitive offers made to the Spot Market; and
- To the extent possible, Spot Market processes are transparent to Market Participants.

These are described in more detail in the following sections.

7.1. Nominations

Each Market Participant is required to nominate to VENCORP ahead of each gas day the quantity of gas it intends to inject into, or withdraw from, the transmission system during that day. These nominations are for VENCORP's scheduling purposes and do not relate to Spot Market trade.

Market Participants will be involved with (at least) two forms of nominations:

- a) Contract nominations:
physical nominations to their Producer(s) under their contracts with them of their daily requirements; and
- b) Market nominations:
financial market-based nominations to VENCORP of injections or withdrawals (as the case may be) to determine their net imbalance in the market. Any net daily imbalance is either purchased or paid for at the daily Market Price.

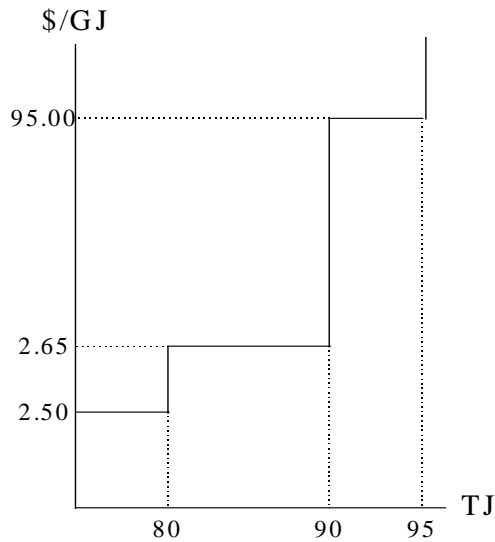
7.2. Inc/Dec Offers

Each Market Participant may also, if it wishes, submit increment/decrement offers (called inc/dec offers) to increase or decrease the quantity injected or withdrawn at some (or all) connection points. Each inc/dec offer may specify several prices and corresponding quantities of injections or withdrawals that the Market Participant is prepared to implement if the Market Price reaches the specified value. A Market Participant can structure its inc/dec offers to include conditions on the way in which VENCORP can schedule its injections or withdrawals due, for example to contractual conditions or physical limitations of a Producer's or Customer's equipment.

Example :The following illustrates injection and withdrawal offers.

Fig. 7.1

Injection Inc/Dec Offer



The above represents an injection inc/dec offer where the Market Participant only wishes to inject gas if the Market Price is \$2.50/GJ or more. It does not wish to inject more than 95 TJ in total, regardless of the Market Price:

If the Market Price is less than \$2.50/GJ, this Market Participant does not wish to inject any gas.

Where the price is exactly \$2.50/GJ, the Market Participant is willing to inject up to 80 TJ.

Where the Market Price is between \$2.50/GJ and \$2.65/GJ, the Market Participant expects that it will have been called to inject 80 TJ.

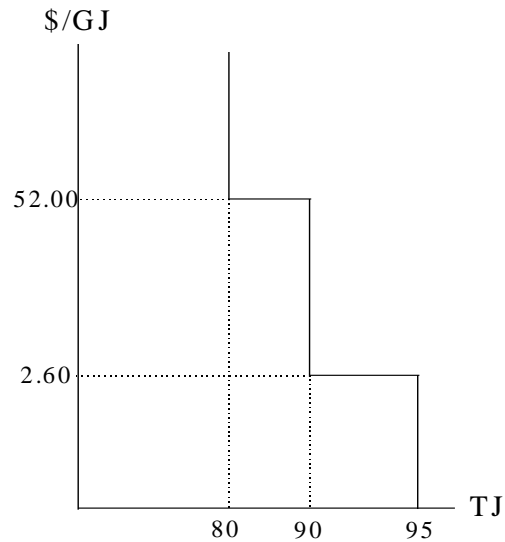
Where the price is exactly \$2.65/GJ, the Market Participant is willing to increase its injection up to 90 TJ.

Where the Market Price is between \$2.65/GJ and \$95.00/GJ, the Market Participant expects that it will have been called to inject 90 TJ.

Where the price is exactly \$95.00/GJ, the Market Participant is willing to increase its injection up to 95 TJ.

Where the Market Price is more than \$95.00/GJ, the Market Participant expects that it will have been called to inject 95 TJ.

Withdrawal Inc/Dec Offer



The above represents a withdrawal inc/dec offer where the Market Participant wishes to be able to withdraw a certain quantity of gas, 80 TJ, regardless of the Market Price. The Market Participant is willing to withdraw up to 95 TJ of gas if the Market Price is sufficiently low. Where the Market Price is less attractive (higher) it wishes to reduce its withdrawals of gas back towards 80 TJ:

Where the Market Price is less than \$2.60/GJ, the Market Participant expects that it will be able to withdraw 95 TJ.

The Market Participant is willing to reduce its withdrawals down to 80 TJ when the Market Price is exactly \$2.60/GJ.

Where the Market Price is between \$2.60/GJ and \$52.00/GJ, the Market Participant expects that it will be able to withdraw 90 TJ.

The Market Participant is willing to reduce its withdrawals down to 80 TJ when the Market Price is exactly \$52.00/GJ.

Nominations and inc/dec offers are based on intervals of one hour for scheduling and to ensure that VENCORP can manage changing conditions on the gas transmission system during the day.

Note that Market Participants are not required to submit inc/dec offers. A Market Participant who does not submit inc/dec offers will have its gas delivered without reference to the Spot Market, provided they withdraw the same amount they inject. The only time when such a Market Participant will not receive the gas it injects is in the event of an emergency, when all Spot Market offers (including LNG) have been scheduled and all known unauthorised transmission system users have been curtailed. In such an event, the Market Participant would be paid the Value of Lost Load ('VoLL'), proposed to be \$800/GJ.

See Appendix 1 for additional Inc/Dec Examples

7.3. How is Gas Scheduled?

VENCorp prepares a preliminary operating schedule two days ahead of each gas day, setting out the quantities of gas which are to be injected and withdrawn to satisfy the demands nominated by Market Participants. This schedule is updated one day ahead of the relevant gas day and again at the start of the gas day. If necessary it is further updated during the day, to take account of any changes to conditions during the day. The scheduling process provides Market Participants with the opportunity to adjust their contract and market nominations and inc/dec offers to attempt to maximise their commercial positions.

In preparing operating schedules, all of the Spot Market nominations are considered. VENCORP is required to utilise inc/dec offers in Market Price order (having due regard to any attached conditions and system security). In this way the defined physical operating criteria for the transmission system are satisfied in the most economic manner using the offers by Market Participants in the most efficient manner.

During each gas day, VENCORP monitors the actual gas demands and other transmission system operating parameters and issues appropriate scheduling instructions calling on Market Participants to implement their inc/dec offers.

7.4. Linepack Management

7.4.1. Physical Linepack

VENCorp manages the actual physical linepack in the gas transmission system by considering injections, withdrawals, and VENCORP's security targets for quantity and distribution of linepack around the system over the day. The objective in doing so is to ensure that this distribution is adequate to reliably meet demand in the next day.

7.4.2. End of Day (EoD) Linepack

EoD Linepack is a financial instrument which allows Market Participants to hedge against the day-to-day variation in gas prices. Each day, Market Participants can submit bids for EoD Linepack. The total amount of EoD Linepack which Market Participants can purchase is limited by the physical storage capacity of the gas transmission system.

In effect, this allows Market Participants to bid for and buy an allocation of EoD Linepack at today's Market Price, and to sell this allocation at tomorrow's Market Price.

7.5. How is the Market Price determined?

The operational scheduling of gas flows on the Victorian transmission system needs to take into account the physical capacity and characteristics of the transmission system, and is based on the forecast demand and system conditions for the day, with the schedule being updated during the day whenever there are material changes.

However, analysis of the Victorian transmission system has shown that, over the next few years, binding constraints on the capability of the transmission system to transport gas from Producers to Customers, and significant changes in demand and system conditions from those forecast at the start of the gas day, typically occur on only a few days of the year. In the absence of such constraints, or "surprises" during the day, such as a cold snap, the marginal value of gas will be the same all day everywhere on the system. This is because, under these conditions, any incremental demand, at any time of day, can likewise be met with an injection of gas from the same marginally priced source at any time of the day.

Reflecting this, the Spot Market is to be implemented initially with a single daily Market Price which applies all day, everywhere in the gas transmission system². This price is to be determined at the end of each gas day, based on the actual demand for gas during the day and ignoring the effects of transmission constraints and the timing lags in the transport of gas.

Figure 7.1 :

A Simplified Overview of Pricing

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In the example, the actual demand for gas on the day is 550TJ. In the absence of any constraints, this demand can be met by scheduling all of the gas offered into the Spot Market by Retailers A and B, and 150TJ of the gas offered by Producer X.

None of Retailer C's gas at \$7.00/GJ would be scheduled to flow.

The Market Price for the day is set by the highest priced gas scheduled for the day, i.e. Producer X's gas at \$2.85/GJ.

All Market Participants' imbalances on the day are settled out at the Market Price of \$2.85/GJ - even if these imbalances are due to scheduled injections of gas in accordance with inc/dec offers submitted at a lower price, as is the case for Retailers A and B.

7.6. Why do we need Ancillary Payments?

The Spot Market is based on a daily Market Price which applies everywhere in the gas transmission system. This price setting mechanism ignores transmission constraints and the time delays in transport of gas.

On most days during the next few years, the gas transmission system will be constraint free. VENCORP will be able to manage the operation of the gas transmission system so that transmission constraints and surprises do not have an impact on the market outcome.

On the relatively infrequent occasions when transmission constraints arise or there are surprises during the day which impact on the Spot Market:

- The uniform daily price will not provide a clear pricing signal which would encourage Market Participants to respond appropriately.
- VENCORP must manage the gas transmission system during the day by scheduling for hourly and locational needs. It will do this by scheduling increases or decreases in injections or withdrawals of gas, in accordance with inc/dec offers submitted by Market Participants.
- Since the uniform daily Market Price is determined after the end of the day, with perfect hindsight of the actual system demand and ignoring pipeline constraints, some Market Participants may find that the resultant daily Market Price is less than the price of their scheduled inc/dec offer. In these cases, the Market Participants will expect to be compensated, and will be entitled to be compensated for, complying with VENCORP instructions which put them at a disadvantage in comparison to the Market Price outcome. Such compensation is to be provided through "Ancillary Payments".

² The Market Rules provide for a change to locational and hourly Spot Market prices from December 2000, see section 12.

Example: The need for Ancillary Payments

The need for Ancillary Payments will arise for example, where a transmission constraint requires VENCORP to call on LNG injection offers to cope with a transmission constraint:

- A transmission constraint between Longford and Melbourne arises such that not all gas injections at Longford can be delivered:
 - ⇒ In other words, the single zone model (with a single price) does not address the issue that the value of gas might be higher if the gas is close to the point of consumption relative to gas that is several kilometres away. Consequently there will be occasions when VENCORP need to bridge this value difference;
 - ⇒ Gas is offered for \$6 at Longford but is not called for injection because the constraint limits the ability to transmit gas to Melbourne;
- VENCORP calls on the next most economic option, which is, say, LNG injection-offered at \$8/GJ;
- The unconstrained Market Price will be \$6/GJ;
- If the offer price of \$8/GJ accurately reflects the cost to the relevant Market Participant of LNG injections, the Market Participant will lose \$2/GJ if it injects LNG as requested and is only paid \$6/GJ for it;
- An ancillary payment of \$2/GJ is thus made to the relevant Market Participant in addition to the \$6 from the Spot Market to compensate them for the \$8 GJ.

7.7. Treatment of Ancillary Payments

Analysis of the Victorian transmission system indicates that the quantum of Ancillary Payments will be small. Funding for the ancillary payment is through an “Uplift Charge” allocated to Market Participants as described in section 8.3.

7.8. What are the Metering and Settlement Arrangements?

To enable gas injections and withdrawals to be determined for each Market Participant, a metering installation is required at all connection points on the transmission system and for Customers who have elected to become full Market Participants or have changed the Retailer from whom they purchase their gas. These metering installations measure and store hourly gas flows and the data is periodically transmitted electronically to a central metering database managed by VENCORP. From this data the injection/withdrawal imbalance is determined for each Market Participant for each gas day.

A Spot Market settlement statement is prepared by VENCORP at the end of each month for each Market Participant. For each gas day in the month, the amount payable to or by each Market Participant is determined from their injection/withdrawal imbalance and the Market Price. To this is added any relevant Ancillary Payments, uplift charges, market fees and any payment associated with End of Day Linepack and these are aggregated to give a monthly settlement amount. Full supporting data is issued with each settlement statement to enable each Market Participant to independently confirm all settlement amounts.

Payment occurs on the 20th working day of each month to allow time for Market Participants to check the settlement statements and for most queries and issues to be resolved.

7.9. What market information will be provided?

The intention is that the Spot Market processes be as transparent as possible while satisfying commercial confidentiality requirements. To this end, VENCORP publishes to Market Participants a wide range of market information including preliminary and final operating schedules, Market Price, aggregate gas withdrawals and injections, quantities and prices of inc/dec offers and End Of Day Linepack quantities.

In addition, VENCORP publishes an annual planning review containing forecasts of gas supply and demand and transmission system capability for the next five years and quarterly planning reviews giving more detailed forecasts of conditions for the next 12 month period.

Market information and settlement statements and relevant supporting data will be published electronically on a Market Information Bulletin Board (MIBB). This provides convenient access to the large volumes of information while also providing access controls so that each Market Participant can only access market information to which they are entitled.

Market Information

<i>Information</i>	<i>Provided By</i>	<i>Provided To</i>	<i>Provided When</i>
Market Participant Information			
Market Participant lists	VENCORP	Market Participants	As necessary
Spot Market Information			
Forecasts: Preliminary and final operating schedules including forecast withdrawals, supply availability, Market Price, linepack	VENCORP	Market Participants	Two days ahead One day ahead On day
Actual: Market Price, injection quantities, inc/dec offer price and quantities, EoD Linepack quantity, price and bids	VENCORP	Market Participants	Next day
Market Price and total gas withdrawals	VENCORP	Public	Daily
Settlement statements and supporting data	VENCORP	Market Participants	Monthly
Metering data	VENCORP	Market Participants	Accessible as desired
Planning Information			
Annual planning review (5 yr. outlook)	VENCORP	Market Participants	Annually
Quarterly planning review (1 yr. outlook)	VENCORP	Market Participants	Quarterly
Forecasts of supply and demand Information on storage availability and pipeline augmentations	Market Participants	VENCORP	Annually and when material changes occur

8. How are rights for Transportation Provided?

The implementation of the proposed Spot Market arrangements has implications for the rights and obligations of parties with respect to use of the pipeline for gas transportation.

On other transmission systems around the world, transportation rights are commonly dealt with through what is referred to as a “contract carriage” model.

Under the “contract carriage” approach, parties are only entitled to transport gas to the extent that they have contracted for capacity, and they pay for that contracted capacity whether or not they actually use it in full.

This approach is not being introduced in the Victorian Spot Market, as it is not sufficiently flexible to be compatible with the proposed market arrangements. The intent to completely deregulate the market, including domestic Customers, means that Retailers will have no long term guaranteed Customer base. Retailers will not, therefore, be well placed to enter into long term “take or pay” capacity contracts. Also, given that there may well be a number of different gas sources available to Victorian Customers within the next few years, and that Market Participants may purchase gas from the Spot Market such that they will not know where that gas is sourced from, it would not be practical to implement a transportation model which involved contracting for “point to point” transportation capacity.

Therefore, a transportation model, the “Market Carriage” model, has been developed which is consistent with the proposed Spot Market and which achieves the following important objectives:

- It provides confidence that parties will be able to obtain a transportation service which is both financially and physically “firm”.
- It provides appropriate incentives for parties to undertake and pay for augmentation of the pipeline, i.e. in return for funding pipeline augmentations, parties will receive a legally enforceable property right which they can subsequently trade if they wish.

8.1. Summary of Market Carriage Model

The essential features of the Market Carriage approach to transportation capacity are summarised as follows:

- VENCORP and TPA will enter into and maintain a “Service Envelope” agreement, which defines the level of transportation capacity to be provided by TPA under its access arrangement. This will need to meet the requirements of the existing authorised large Customers, plus anticipated load growth amongst small (Tariff V) Customers.
- Small (Tariff V) Customers will receive Authorised MDQ for whatever they actually use, and prior to commencement of the Spot Market, there will be an initial allocation of “Authorised MDQ” to existing large (Tariff D) Customers.
- Where a party subsequently negotiates with and pays TPA to augment the pipeline, it will receive an additional MDQ authorisation commensurate with the agreed increase in the Service Envelope attributable to that augmentation.
- Where transmission constraints give rise to Ancillary Payments being made, uplift charges are allocated in such a way as to “penalise” those parties who have contributed to the cause of those constraints (for example, by using gas in excess of their authorised MDQ) - this being the mechanism by which the Market Carriage model provides the holders of authorised MDQ with “financially firm” transportation rights.

- If a transmission constraint is sufficiently serious to result in a requirement for the interruption of gas supplies, then wherever practicable, VENCORP will seek to curtail Customers using gas without, or above, their authorised MDQ before curtailing authorised Customers - thus providing such authorised gas users with “physically firm” rights.

8.2. Authorised Maximum Daily Quantity

Each Customer is categorised as authorised or unauthorised. Service reliability is maintained by restricting the amount of authorised use of the system to that which can be accommodated by the existing physical capacity. Where a Customer wishes to increase its authorised quantity, and where there is no existing spare capacity, it must arrange for a commensurate level of augmentation to be undertaken.

Each Retailer will receive an authorised Maximum Daily Quantity (MDQ) limit for each of its Customers when the Spot Market is established. This will be based on the MDQ that each major Customer currently has been allotted by Gascor as well as an allowance for Tariff V (domestic) users. The authorised MDQ will move with Customers as they change Retailers. New small Customers will automatically be authorised; new large Customers (or their Retailers) must apply to VENCORP to gain authorisation which will be dependent on “spare” existing capacity being available.

These authorisations are defined in the table below.

<i>Customer Supplied</i>	<i>Tariff V</i>	<i>Tariff D</i>
<i>Existing</i>	Automatically Authorised	Automatically Authorised up to specified MDQ
<i>New</i>	Automatically Authorised	Not Automatically Authorised

On many days there will be spare capacity and parties need not control their gas flow to their authorised MDQ limits. However, any unauthorised gas flows do not have the guarantee of “firm service” which is enjoyed by authorised users. On days when the system is congested, unauthorised users will be penalised financially through the allocation of uplift charges (as described in Section 8.3). If necessary, unauthorised Customers may also be curtailed ahead of authorised Customers.

VENCORP and TPA must enter into and maintain a “Service Envelope” agreement which defines the transmission pipeline capacity to be made available to meet existing authorised Customers needs, plus anticipated load growth from small (Tariff V) Customers. The Service Envelope implies a base level of system capacity.

If spare capacity is not available, new large Customers seeking MDQ authorisation may arrange for additional augmentation with TPA or another pipeline. If this augmentation is undertaken, the Service Envelope will be expanded accordingly and those Customers who have funded the augmentation will receive MDQ authorisation commensurate with that increase.

The Market Carriage arrangements are based on establishment of the Spot Market with a single zone model where price is the same everywhere. If multiple zones are introduced as part of a change to locational pricing (refer section 11), it is likely that basis hedges (previously known as transmission rights) will also be introduced and replace the concept of authorised MDQ as a means of providing Market Participants access to a financially firm transmission service.

8.3. Allocation of Uplift Charges

As indicated in section 7.6, uplift charges are allocated to Market Participants to fund Ancillary Payments to Market Participants. This allocation is based on the Market Carriage arrangements and aims to allocate uplift payments according to the respective contributions to the occurrence of the transmission constraint as follows:

a) Congestion component

- To the extent that the transmission constraint is caused by a failure of TPA to satisfy the defined “Service Envelope”, this component of the Uplift Charge is paid by TPA;
- To the extent that the transmission constraint is caused by users exceeding their authorised level of MDQ, this component of the Uplift Charge is paid by these users;
- Any residual component (if any) of the Uplift Charge is allocated across all users.

b) Surprise component

- Allocated across all users

Set out below is an example of the allocation of an uplift charge. In this example, it is assumed that demand for the transmission system exceeded supply of the transmission system by 100 TJ, and that it cost \$300,000 to free up that amount of capacity (by calling inc/dec offers).

Reason for Congestion	Amount of Congestion (TJ)	Pro rata Uplift (\$k)	Pro rata Uplift (c/GJ)	Allocated to
Surprise event	990-970 = 20TJ	$\frac{20}{100} \times 300 = \$60k$	$\frac{60}{970} = 6.2c/GJ$	All retailers
Transmission system capability below service envelope	1000-990 = 10TJ	$\frac{10}{100} \times 300 = \$30k$	N/A	TPA
Authorised load above service envelope	1030-1000 = 30TJ	$\frac{30}{100} \times 300 = \$90k$	$\frac{90}{930} = 9.7 c/GJ$	Authorised Retailers
Unauthorised Load	40TJ	$\frac{40}{100} \times 300 = \$120k$	$\frac{120}{40} = 300.0 c/GJ$	Unauthorised retailers
Total	100	300	N/A	

Therefore, in this example, authorised retailers pay a total of $(6.2 + 9.7 c/GJ) = 15.9 c/GJ$, whereas unauthorised retailers pay a total of $(6.2 + 300.0 c/GJ) = 306.2 c/GJ$. If uplift had not been differentially allocated, but had been spread equally across all retailers, authorised (and unauthorised) retailers would have had to pay $(\$300,000 \div 970 TJ) = 30.9 c/GJ$.

The actual allocation process will be more complex than this example, but it is intended that the same broad principles will be applied. Uplift allocation is defined in detail in the Market and System Operations Rules.

9. Tariffs

9.1. Transmission Tariffs

Transmission Tariffs relate to the cost of using the transmission system and should be distinguished from costs associated with the Spot Market.

The Transmission Tariffs are structured to reflect the fact that it costs more to deliver gas over long distances than to deliver it over short distances. In determining the Transmission Tariffs it has been assumed that gas is injected predominantly at Longford (“Injection Point”) and transported to a central delivery point referred to as the “Hub”. Gas is then assumed to flow from the Hub to a Transfer Point (i.e. to the point where the gas is transferred from the transmission network to the distribution network). In order to reflect the cost of longer distances but to avoid the need to publish hundreds of different tariffs, TPA has eight pricing zones.

The amount of transmission capacity (and therefore investment) that is required for the transmission of gas is determined by the period when it is used the most. Use of gas in Victoria is highest in the peak season (June to September), when the gas is used for space heating (particularly households). To reflect the fact that the capacity of the system has been built to meet peak load, a large portion of TPA’s Transmission Tariffs are based on consumption over the peak period. The balance of the Transmission Tariffs are based on annual consumption.

There are three charges in the Transmission Tariffs, two “Peak” charges and one general “Anytime Delivery” charge. They are:

1. **Peak Injection Charge** which is based on the five peak injection days for gas injected into TPA’s transmission network at Longford to the Hub. For the first five year regulatory period, ending 31 December 2002, there is only one tariffed injection point; and
2. **Peak Delivery Charge** which is based on gas flowed to the Transfer Point on the five transmission network peak days and applies regardless the source of gas. The Peak Delivery Charge comprises two components depending on who the end use Customer is:
 - **Peak Demand Charges** for Customers that have daily meters; and
 - **Peak Volume Charges** for those Customers that do not have a daily meter.
3. **Anytime Delivery Charge** is an annual volume Transmission Tariff which TPA charges all Customers for the actual amount of gas that is delivered. This is called the “Anytime Delivery Charge” because it applies anytime during the year that the transmission system is used.

	Delivery Service For Daily Metered Customers	Delivery Service For Non Daily Metered Customers	Injection Service
Peak Charges	Called Peak Demand Charge . Actual gas delivered on the five days of highest system demand over the peak period (June to September).	Called Peak Volume Charge . Actual gas delivered over the peak period (June to September).	Called Peak Injection Charge . Actual gas injected on the five days of highest injected demand over the peak period (June to September).
Anytime Delivery	Actual gas delivered over the calendar	Actual gas delivered over the calendar	Not charged for

Charge	year.	year.	injection.
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While Customers will not definitively know which days are the five peak system days until after they have occurred, it will be possible to make an effort to reduce consumption on days which might be the peak days by considering the weather and the scheduling information published by VENCORP (see section 7.9).

The transmission charges can be summarised as:

- To calculate the total Peak Demand Charge for a particular Daily Metered Customer, the number of gigajoules that the Customer consumed on the five peak days is multiplied by the zonal tariff. In the extreme, where the Customer has no consumption on the five peak system days but major consumption on the other 360 days, that Customer will pay nothing for the annual Peak Demand Charge.
- To calculate the total Peak Volume Charge for a particular Non-Daily Metered Customer, the number of gigajoules that the Customer consumed in the peak period (June to September) is multiplied by the zonal tariff.

9.2. Distribution Tariffs

The three companies that own distribution pipelines in Victoria will be paid for the service of transporting the gas from the TPA pipeline to the Customers. Distributors do not sell gas and they are not Market Participants. Their role is exclusively to transport gas.

Charges to Tariff D Customers will be based on the single maximum hourly consumption metered in a calendar year. In order to charge the Customer over the course of the year rather than once per year, the charges to Tariff D Customers will be based on the forecast consumption, and there will be an adjustment to the bill if consumption increases. If Customers do not reach the same level of consumption by September, there will be a reduction in the bill to adjust for actual consumption.

Tariff V Customers will be charged a fixed daily amount and a variable charge based on consumption. The variable charge will be different in peak and off-peak periods.

9.3. Term of Transmission and Distribution Tariffs

The Transmission and Distribution Tariffs will apply until 31 December 2002, when the Regulator will approve new tariffs. The Regulator is required to follow certain guidelines which include a fair sharing of the benefits achieved through efficiency gains. The structure of the new tariffs must be based on the CPI-X format (where a tariff is set initially and changes each year by the Consumer Price Index less a certain percentage), and must be implemented for a period of at least five years. The Regulator is also required to consider whether tariffs reflect costs and to provide a smooth transition path if tariffs are not cost reflective.

10. Other Relevant Topics

10.1. LNG

LNG, or **Liquefied Natural Gas**, is stored in a facility owned by TPA and is located in Dandenong. In liquid form, gas takes up relatively little space, and it can be converted to gaseous form and injected into the system during periods when, for example, demand is very high.

Although TPA owns the LNG storage facility, the facility is operated as if it were a warehouse, where TPA is paid for storing the LNG, but other parties decide when the LNG will be distributed. VENCORP will control a portion of the storage capacity which is reserved for the maintenance of system security, and the Retailers will each control a portion of the storage capacity for the purpose of selling gas into the Spot Market. Because LNG is important to maintaining system security, the Market and System Operations Rules impose special requirements on how the storage facility is used and how LNG is offered into the Spot Market.

10.2. Underground Gas Storage (UGS)

Currently through the efforts of TPA, the State is developing an underground gas storage facility near Port Campbell, together with related pipeline facilities (the South West Pipeline) that will connect the storage facilities to the principal TPA transmission system. The State intends to seek a private developer to build, own, and operate the facilities, which are scheduled to be in full operation in 2001.

As a general matter, the operation of the underground gas storage facility will be treated for purposes of the Market Rules like other sources of gas supply and withdrawal. The point at which gas is injected into the underground gas storage facility, is treated as a withdrawal point on the TPA system. The same point at which it is re-injected into the market is an injection point for purposes of the Market and System Operations Rules.

To the extent that the operator of the facilities also trades in gas, it will be registered as a Market Participant. Retailers or others that contract to use the underground gas storage facilities for gas they own will similarly be able to inject and withdraw gas from and to the underground gas storage facilities as Market Participants.

10.3. NSW Pipeline Interconnection

A connection between the NSW and Victorian gas pipeline systems is under construction and expected to be completed by October 1998. It will link the northern end of TPA's system near Albury with the Moomba to Sydney transmission pipelines owned by EAPL at Wagga Wagga.

Market Participants wishing to transport gas beyond TPA's pipeline into NSW will need to make separate arrangements for transport beyond the TPA system.

It is intended that VENCORP will enter into a balancing agreement with EAPL to facilitate the flow of gas through the two systems. The balancing agreement will be structured such that gas will be deemed to flow between the States, regardless of the physical direction that gas is travelling through the interconnect at any point in time. The balancing agreement removes the need for Market Participants to attempt to trace the physical flow of gas.

11. Transition to Future Market Developments

The initial market design reflects a judgement that less complex pricing arrangements are preferable, with infrequent constraints being managed through Ancillary Payments.

As Market Participants gain experience, and growth in the gas market makes constraints more significant, it is considered desirable to allow for a transition to more sophisticated pricing arrangements that remove the need for Ancillary Payments.

The design of the Spot Market is essentially based on hourly time intervals (nominations and inc/dec offers and operating schedules are prepared on an hourly basis) even though the initial implementation of the Spot Market provides a trading interval of a day and a single daily Spot Market Price. The initial implementation also provides for a single price across the entire transmission system.

The market will consider transition from a uniform, daily Market Price to locational and hourly pricing. A review of the access arrangements under the Market Carriage regime will also be carried out concurrently. This review will consider the desirability of proposals involving the introduction of linepack and basis hedges as financial instruments for managing the risks associated with constraints.

- The Market and System Operations Rules will specify that there will be consideration given to a change to locational and hourly pricing by 1 December 2000.
- The Market and System Operations Rules will also set out the terms of reference and governance arrangements for a review process to be conducted between September and December 1999 to confirm whether the change should proceed and, if so, to specify the details of the change and the pre-conditions to be met prior to implementation of the change.
- The review has the following criteria included in its terms of reference:
 - The materiality of the issue, considering the extent of Ancillary Payments in the past and likely future payments;
 - Future expectations for market and transmission system development, including increasing diversity in the sources of gas supply;
 - Equitable preservation of the existing rights and risk positions of Market Participants, as far as practicable;
 - Overall market efficiency and competitiveness;
 - The interests of Customers.

12. Appendix 1 - Further Information

Other helpful Market Establishment Project Publications

"Victorian Gas Industry Market and System Operations Rules"

"Victorian Gas Industry Tariff Order Outline"

"Victorian Gas Market Clearing Logic Version 1.2"

"The Framework for Market Carriage and Market Evolution"

Other sources of information

The Energy Projects Division has established a web site, with a Gas Market Establishment page. You will find Market Establishment Project deliverables and gas market information at this site.

<http://www.energy.dtf.vic.gov.au>

VENCorp Website:

<http://energy.net.au>

Also of interest:

The Australian Competition and Consumer Commission (ACCC) have a web site which will include gas market information in the near future.

<http://www.accc.gov.au/>

The Office of the Regulator General has a web site which may also contain useful gas market information.

<http://www.reggen.vic.gov.au/>

Contact Details

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13. Appendix 2 Glossary of Terms

Ancillary Payments	Additional payments made to Market Participants to compensate when transmission constraints or surprises result in them being disadvantaged by a uniform, daily Market Price.
Access Arrangement	An arrangement for access to a pipeline or part of a pipeline approved by the Australian Competition and Consumer Commission (ACCC) or Office of the Regulator General (ORG) as relevant under the Access Code.
Access Code	The Victorian Third Party Access Code for Natural Gas Pipeline Systems established under the Gas Industry Act (1994).
Bundled Product	A single commercial relationship between Retailers and Customers that incorporates payments for gas and all other transportation services.
Contestable Customer	A Customer who is not franchised to a Retailer and who is able to choose their Retailer (be contested for) or become a Market Participant.
CPI	Consumer Price Index
Customer	Any party who purchases gas and consumes gas at a particular premises. Customers can deal through Retailers or may choose to become Market Participants in their own right and take on the retailing functions themselves.
Distribution Pipeline	Pipelines for the conveyance of gas which: a) have a maximum allowable operating pressure of 515kPa or less; or b) where they have a maximum operating pressure above 515kPa, are uniquely identified as a distribution pipeline in the Distributor's access arrangement.
Distributor	The owners of the distribution pipelines which transport gas from the Transmission Pipeline Authority pipelines to the end consumer.
End Of Day (EoD) Linepack	A financial instrument to allow Market Participants to hedge against the day-day variation in gas prices
Final Operating Schedule	The operating schedule produced by VENCORP relating to the current day, and updated as needed during the day.
GJ	Gigajoule, SI unit (10^9 joules)
Inc/Dec Offer	An offer by a Market Participant to either increase (inc) or decrease (dec): a) the amount of gas supplied from a Producer under their contract with that Producer, for a specified price; or b) the amount of gas they or their Customers will consume for a specified price.
Injection	The physical insertion of gas in to the gas transmission system.
J	Joule. A unit of energy as defined in AS1000-1979 "The International System of Units (SI) and its Application"
kPa	Kilopascal. 1000 pascal, where pascal is gauge pressure in excess of atmospheric pressure as defined in AS1000-1979 "The International System of Units (SI) and its Application"

LNG	Liquefied natural gas
LNG Storage	The facility located at Dandenong for the storage of LNG.
Market Clearing Logic	The detailed methodology used to clear the spot market, which entails finding the optimum combination of offers such that the cost of supplying the spot market demand is minimised.
Market Information Bulletin Board (MIBB)	A VENCORP electronic facility (bulletin board on internet) for the publication of information to Market Participants, including information relating to market forecasts and outcomes, system conditions etc.
Market Participant	A party who is eligible, by registration with VENCORP, to trade gas on the spot market via submission of inc/dec offers to VENCORP.
Market Price	The price at which the spot market clears, and at which Market transactions are settled.
MDQ	Maximum daily quantity
Nomination	Market Participants will be involved with (at least) two forms of nominations: <ul style="list-style-type: none"> a) Contract nominations: physical nominations to their Producer(s) under their contracts with them of their daily requirements; and b) Market nominations: financial market-based nominations to VENCORP of injections or withdrawals (as the case may be) to determine their net imbalance in the market. Any net daily imbalance is either purchased or paid for at the daily Market Price.
Non-Contestable Customer	A Customer to whom a franchise Retailer has exclusive right under a retail licence to sell gas at a distribution delivery point; as defined under the Gas Industry Act.
Operating Schedule	VENCORP's schedule of expected injections and withdrawals for each hour at each injection or withdrawal point, which it will use to balance the system.
Physical Linepack	The actual amount of gas stored in the transmission system and where it is located.
PJ	petajoule, SI unit (10^{15} joules)
Preliminary Schedule	The operating schedule produced by and updated by VENCORP relating to the expected market outcome on the next day.
Operating Schedule	
Producer	Those involved in drilling, extracting and processing natural gas.
Regulator	The statutory authorities responsible for regulating the Victorian Gas Industry
Retailer	Those selling the bundled product of gas services to the Customers; buying gas from Producer(s), transmission services from VENCORP and distribution services from the Distributors.
Service Envelope	The minimum level of transmission capacity which TPA is obliged to provide under its agreement with VENCORP.
Short Term Forward Market	A secondary market to assist with risk management by facilitating the short-term trading of financial contracts or hedging arrangements.
Spot Market	A competitive market administered by VENCORP to facilitate the physical balancing through trading of gas where gas is bought and

	sold at a variable price.
Surprises	Events which can happen within the day for which, in order to operationally balance the system, VENCORP may need to change the schedule of gas injections and/or withdrawals issued at the start of the gas day. For example, this can occur where the weather unexpectedly turns cold part way through the day, resulting in a sudden increase in withdrawals to meet unexpected consumer demand.
Tariff Order	The Victorian Gas Industry Tariff Order, under the Victorian Gas Industry Act (1994) as amended.
TJ	terajoule, SI unit (10^{12} joules)
TPA	Transmission Pipelines Australia, owner of the major pipeline in Victoria,
Transmission	The conveyance of gas from the injection point to the start of the distribution network or other withdrawal points, (such as UGS, LNG storage, etc.).
Transmission Constraint	A constraint in the transmission system causing the delivery of gas in any part of the system to be restricted.
Transmission System	The physical components involved in the conveyance of gas, including all pipelines, compressors and other assets.
Vencorp	Victorian Energy Networks Corporation, the market and system operator.
Withdrawal	The physical drawing of gas from the transmission system.

13.1. Conversion factors for Units

Mass: 1 lb. = 0.453 592 37 kg

Temperature: R is the *rankine* unit of *thermodynamic temperature*, defined in terms of *Kelvin* K, where 1 R = 1/1.8 K

Energy: 1 calorie (cal) = 4.1868 J where calorie is the International Table calorie

Energy conversion (Australian \Rightarrow USA):

Australian unit: gigajoule, **GJ**

USA unit: dekatherm, **Dth** or **Dk**

1 Dk = 10^6 Btu (*British thermal units*)

= $\frac{4.1868 \times 0.453\ 592\ 37}{1.8}$ GJ

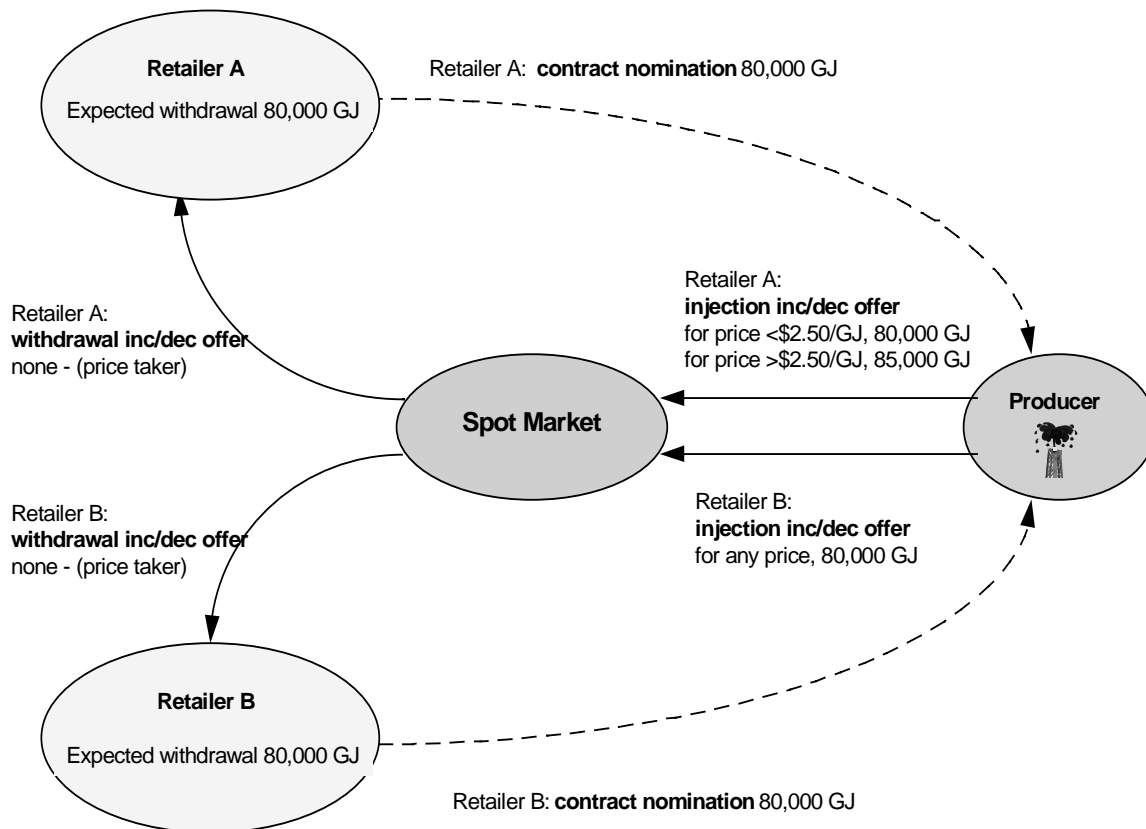
1.8

1 Dk \approx 1.055056 GJ

14. Appendix 3 - Additional Inc/Dec Examples

Example 1:

Increasing supply by calling on an injection inc/dec offer



Both Retailers A and B have contracts with the Producer for up to 100,000 GJ per day. Both Retailers A and B expect their demand for the day will be 80,000 GJ and have nominated 80,000 GJ for the day with their Producer under their contracts.

Retailer A has provided an injection inc/dec offer indicating that it:

- Is prepared to inject its nominated quantity of 80,000 GJ, via its contract with its Producer, where Market Price is less than $\$2.50/\text{GJ}$; and
- Is prepared to increase its injection up to 85,000 GJ, via its contract with the Producer, when the Market Price is $\$2.50/\text{GJ}$ or above.

Retailer B has provided an injection inc/dec offer indicating that it:

- Wishes to inject its nominated quantity of 80,000 GJ regardless of the Market Price.

Neither Retailer has submitted any withdrawal inc/dec offers, indicating that they are price-takers for all their withdrawals.

On the day, extra consumption of 5,000 GJ occurs, and VENCORP calls on the injection and withdrawal inc/dec offers in cost order to balance the system. Retailer A's injection inc/dec offer is the economic option.

VENCORP calls on Retailer A's injection inc/dec offer to increase its injection to 85,000 GJ, setting the Market Price at \$2.50/GJ. VENCORP does not need to know at this point whether it is in fact Retailer A that is taking more gas than nominated, or some other Market Participant.

Upon receipt of the metering data, it is shown that Retailer A in fact used only its nomination of 80,000 GJ and it was Retailer B who withdrew 85,000 GJ:

- Retailer B is accredited with its extra 5,000 GJ of withdrawals as an imbalance for the day for which it is debited at the Market Price.
- Retailer A is accredited with its extra 5,000 GJ of injections as an imbalance for the day for which it is credited at the Market Price.
- In effect therefore, Retailer B has purchased 5,000 GJ of withdrawals on the Spot Market, and Retailer A has sold 5,000 GJ of injections on the Spot Market, all transactions being settled at the Market Price (\$2.50 /GJ).

Settlement:

Contract payments - external to the spot market:

- Retailer A pays contract price to its Producer for injections of 85,000 GJ.
- Retailer B pays contract price to its Producer for injections of 80,000 GJ.

Spot Market settlements:

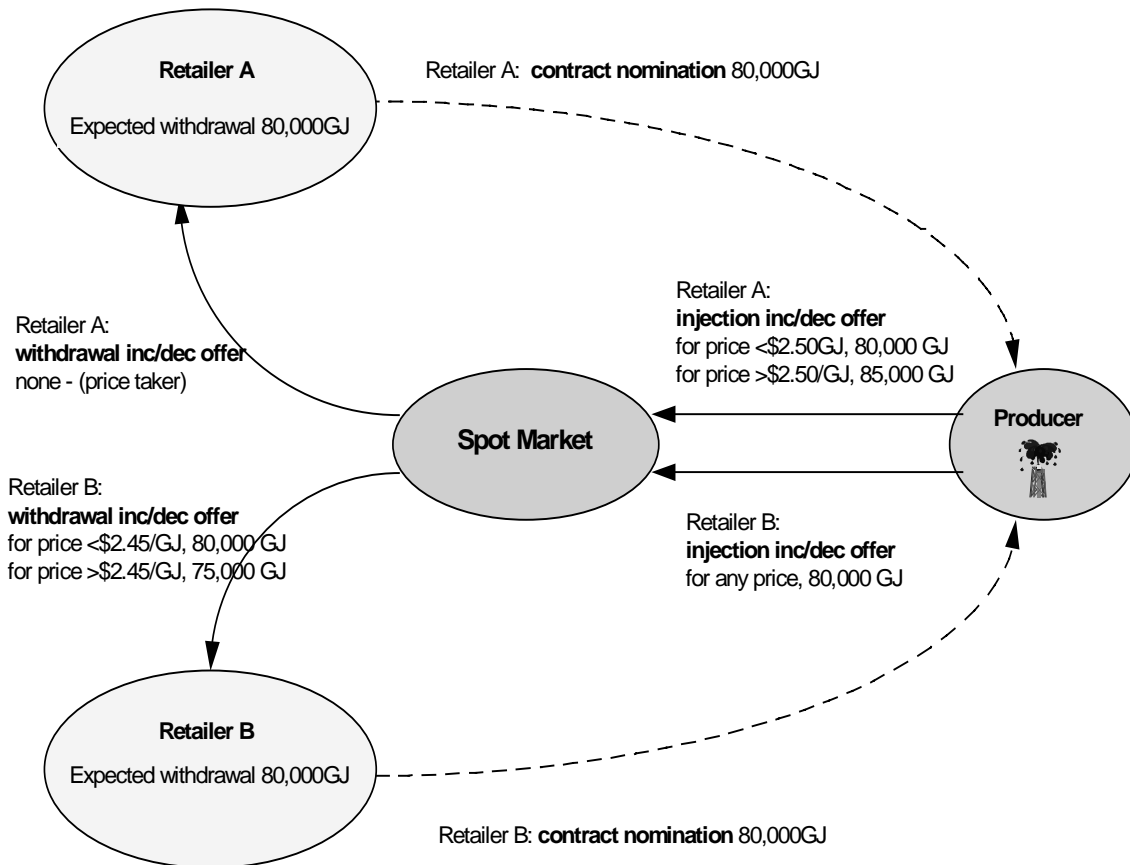
- Retailer B pays Market Price for 5,000 GJ taken above nomination

$$= \$2.50/\text{GJ} \times (5,000 \text{ GJ}) = (\$ 12,500.00)$$
- Retailer A is paid Market Price for its additional injection of 5,000 GJ

$$= \$2.50/\text{GJ} \times 5,000 \text{ GJ} = \$ 12,500.00$$

Example 2:

Decreasing demand by calling on a withdrawal inc/dec offer



Both Retailers A and B have contracts with the Producer for up to 100,000 GJ per day. Both Retailers A and B expect their demand for the day will be 80,000 GJ and have nominated 80,000 GJ for the day with their Producer under their contracts.

Retailer A has provided an injection inc/dec offer indicating that it:

- is prepared to inject its nominated quantity of 80,000 GJ, via its contract with its Producer, where Market Price is less than \$2.50 /GJ; and
- is prepared to increase its injection up to 85,000 GJ, via its contract with the Producer, when the Market Price is \$2.50 /GJ or above.

Retailer A has not submitted a withdrawal inc/dec offer, indicating that it is a price-taker for all of its withdrawals.

Retailer B has provided an injection inc/dec offer indicating that it:

- wishes to inject its nominated quantity of 80,000 GJ regardless of the Market Price.

Retailer B has provided a withdrawal inc/dec offer indicating that it is prepared to reduce its withdrawals down to 75,000 GJ if the Market Price rises to \$2.45/GJ or above.

On the day, extra consumption of 5,000 GJ occurs, and VENCORP calls on the injection and withdrawal inc/dec offers in cost order to balance the system. Retailer B's withdrawal inc/dec offer is the economic option (at \$2.45/GJ) rather than Retailer A's injection inc/dec offer (at \$2.50 /GJ).

VENCORP calls on Retailer B to reduce its consumption to 75,000 GJ under its withdrawal inc/dec offer, setting the Market Price at \$2.45 /GJ. VENCORP does not know at this point of time who in fact is taking more gas than nominated.

Upon receipt of the metering data, it is shown that Retailer A in fact used 85,000 GJ, 5,000 GJ above its nomination of 80,000 GJ and Retailer B used 75,000 GJ in line with its withdrawal inc/dec offer:

- Retailer B is accredited with its 5,000 GJ reduction of withdrawals as an imbalance for the day for which it is credited at the Market Price.
- Retailer A is accredited with its extra 5,000 GJ of withdrawals as an imbalance for the day for which it is debited at the Market Price.
- In effect therefore, Retailer A has purchased 5,000 GJ of withdrawals on the Spot Market, which has been supplied by Retailer B through its reduction in consumption, all transactions being settled at the Market Price (\$2.55 /GJ).

Settlement:

Retailer A pays VENCORP Market Price of \$2.45/GJ for 5,000 GJ (taken above nomination).

VENCORP pays Retailer B Market Price of \$2.45/GJ for 5,000 GJ for its accepted withdrawal offer.

Contract payments - external to the spot market:

- Retailer A pays contract price to its Producer for injections of 80,000 GJ.
- Retailer B pays contract price to its Producer for injections of 80,000 GJ.

Spot Market settlements:

- Retailer A pays Market Price for 5,000 GJ taken above nomination

$$= \$2.45/\text{GJ} \times (5,000 \text{ GJ}) = (\$ 12,250.00)$$

- Retailer B is paid Market Price for its 5,000 GJ reduction in withdrawals under its accepted withdrawal offer

$$= \$ 2.45/\text{GJ} \times 5,000 \text{ GJ} = \$ 12,250.00$$