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New South Wales Government

ENERGY REFORM STRATEGY

Submission in support of application for authorisation

lodged by the Treasurer, the Hon. Eric Roozendaal MLC,
for and on behalf of Delta Electricity, Eraring Energy and Macquarie Generation

in relation to the co-insurance arrangement
for the Energy Reform Strategy

Table of Contents

Executive summary		1
Part A: Application for authorisation		3
1.	Introduction	3
2.	Background	3
3.	Application	7
4.	Criteria for authorisation	9
Part B: The co-insurance arrangement		11
1.	Introduction	11
2.	Overview of Gentrader contracts	14
3.	Overview of co-insurance arrangement	16
Part C: Public benefits of co-insurance		22
1.	Co-insurance is a key element of the energy reform strategy	22
2.	Contracting in the wholesale electricity market	23
3.	Benefits from improved outcomes in the NEM wholesale market	25
4.	Benefits from improved outcomes at the retail level	27
5.	Benefits to the State of NSW	28
6.	Benefits to Gentraders	29
7.	Duration of co-insurance	33
8.	Negligible anti-competitive detriments	35
Appendix 1 Further details of the co-insurance arrangement		37
1.	Payments under the co-insurance arrangement	37
2.	Calling and allocating co-insurance	46
3.	Determining the co-insurance firm quantity and allocation	51

Executive summary

This submission is provided in support of the application by the NSW Treasurer, the Hon. Eric Roozendaal MLC, for and on behalf of Delta Electricity, Eraring Energy and Macquarie Generation (the ***Generators***), for authorisation under Part VII of the *Trade Practices Act 1974* (Cth) (***TPA***) of the Government's proposed co-insurance arrangement which is an important element of the Government's Energy Reform Strategy.

As part of this strategy, the NSW Government is disaggregating the Government's three existing generation portfolios into five Gentrader contract bundles and has designed the co-insurance arrangement to support this competition-enhancing outcome.

The NSW Government proposes to implement the co-insurance arrangement through a multiparty agreement between the Generators and the Gentraders, being the successful bidders for the electricity trading rights of the Generators.

The co-insurance arrangement will enhance competition in the wholesale and retail electricity markets, support potential new generation entrants by helping manage outage risk in the absence of an existing portfolio and facilitate liquidity in the contract market.

In securing these outcomes the co-insurance arrangement is fundamental to the delivery of the Government's Reform Strategy as a whole and delivers the significant public benefits of this essential reform.

Co-insurance allows the Generators to offer a higher level of firm capacity than they would otherwise have under the Gentrader contracts alone. In the event a Generator is unable to meet its firm capacity requirements, then the relevant Gentrader will have the option of calling on the co-insurance.

Public benefits of the co-insurance arrangement include:

- **Co-insurance supports the splitting of the existing generation portfolios** into smaller Gentrader bundles and manages the impact on contract markets that might otherwise result from this (see Part C, sections 1, 4 and 6.1).
- **Co-insurance will facilitate liquid markets for firm contracts** by providing Gentraders with the opportunity to offer a larger volume of firm contracts for a given level of risk (see Part C, section 3.3).
- **Co-insurance enables the Government to offer an increased level of availability** thereby allowing the NSW Government to offer more valuable Gentrader contracts to the market (see Part C, sections 3.3 and 5); and
- **Co-insurance supports potential new generation entrants** by helping manage outage risk through the provision of higher firm capacity than would otherwise be available (see Part C, sections 3.2 and 5).

Authorisation is sought for the following aspects of the co-insurance:

- the payment provisions of the agreement specify the price payable for the compensation which a Gentrader is able to call on when the Generator is unable to meet its firm capacity requirements;
- the firm capacity provisions of the agreement specify the quantity of firm capacity to be made available by each Generator to its Gentrader counterparty for the purpose of the co-insurance arrangement;

- the allocation procedures and rules provided for in the agreement specify which Gentrader will be required to pay compensation and the amount of that compensation; and
- the supply and acquisition of the co-insurance provided pursuant to the co-insurance arrangement is limited to the parties to the agreement.

Authorisation is sought for the co-insurance for a period of 10 years. This period is considered necessary to support the investment that will be made by the Gentraders and to encourage new market entry.

Part A: Application for authorisation

1. Introduction

This submission is provided in support of the application by the NSW Treasurer, the Hon. Eric Roozendaal MLC, for and on behalf of Delta Electricity, Eraring Energy and Macquarie Generation, for authorisation under Part VII of the *Trade Practices Act 1974* (Cth) (***TPA***) to make and give effect to a contract, arrangement or understanding that may otherwise contravene Division 1 of Part IV and section 45 of the TPA.

The subject of this application for authorisation is the proposed Compensation Deed which will put in place a co-insurance arrangement between the State-owned Generators, Delta Electricity, Eraring Energy and Macquarie Generation, and the "Gentraders", being the successful bidders for the electricity trading rights of the Generators pursuant to the NSW Government's Energy Reform Strategy. Co-insurance is a key element of the Energy Reform Strategy.

Part A of the submission sets out background information and further details of the application. Part B contains a more detailed description of the Gentrader contracts and the co-insurance arrangement. Part C contains an analysis of the public benefits of co-insurance and its limited anti-competitive detriments.

2. Background

2.1 Electricity Reform Strategy

On 1 November 2008 the NSW Government announced the Energy Reform Strategy. The key elements of the Energy Reform Strategy are:

- continued State ownership and operation of existing power stations and all electricity networks (the poles and wires) in NSW;
- contracting the electricity trading rights of State-owned power stations to the private sector, commonly referred to as the Gentrader model, with these to be offered in five separate Gentrader bundles (with a requirement that at least one Gentrader bundle be acquired by a new entrant);
- a co-insurance arrangement to manage the loss of portfolio benefits that comes with splitting the existing three State-owned portfolios into the five Gentrader bundles;
- selling key power station development sites around the State; and
- selling the retail arms of EnergyAustralia, Integral Energy and Country Energy, including the retail brands.

An overview of the Energy Reform Strategy is provided in two NSW Government Strategy Documents that have been publicly released[1], as well as in the NSW Government's Competition Memorandum (***Competition Memorandum***).[2]

The NSW Government has recently provided further clarification to potential bidders as to who will be considered to be a new entrant by the Government for the purpose of satisfying the Energy Reform Strategy. On one hand, given the limited independent generation in NSW, nearly any purchaser of a Gentrader bundle will be a new entrant to the generation sector in NSW. However, the NSW Government objective is to have at least one Gentrader bundle acquired by a new entrant to the NEM. To this end, the Government will consider a bidder to be a "new entrant" if that entity does not have bidding control over more than 520MW of scheduled NEM generation capacity. The purpose of

[1] NSW Government, *NSW Energy Reform Strategy – Defining an Industry Framework*, March 2009; NSW Government, *NSW Energy Reform Strategy – Delivering the Strategy*, September 2009.
[2] NSW Government, Energy Reform Strategy Competition Memorandum, September 2009

setting this threshold is to ensure that entities that hold only a small or passive interest in NEM generation assets are not disqualified as new entrants from the Energy Reform Strategy.

2.2 Gentrader model

The Gentrader model creates a functional separation between the ownership of the generation asset and the ownership of contractual rights to trade the capacity of the asset in the wholesale electricity market. Gentrader contracts are being written for each of the nine State-owned power stations in NSW. These contracts will be offered in five bundles. A brief overview of the Gentrader model is provided at section 2 of Part B of this submission, with further details set out in section 2.1 of the Competition Memorandum.

2.3 Co-insurance arrangement

The co-insurance arrangement is an important element of the Gentrader model as it provides Gentraders with a higher level of firm capacity than they would otherwise have under the Gentrader contracts alone. Under the co-insurance arrangement each relevant Gentrader will be offered firm availability (on a financial basis but not a physical basis) up to a pre-defined limit. If the declared availability of a power station subject to co-insurance is less than its firm capacity, then that Gentrader will have a right to call for compensation. The other Gentraders party to the co-insurance arrangement may be called upon to supply the co-insurance. A detailed overview of the co-insurance arrangement is provided in section 3 of Part B of this submission, with further details of the payments that will be made under co-insurance, the rules for calling and allocating of co-insurance and the determination of firm capacity under the co-insurance arrangement set out in Appendix 1.

For the reasons discussed at section 3.2 in Part B, the co-insurance arrangement will apply only to the following State-owned base-load power stations: Bayswater, Liddell, Eraring, Mt Piper, Vales Point and Wallerawang.

The co-insurance arrangement is provided for and will be given effect to pursuant to the Compensation Deed, a multiparty agreement between the Generators (Macquarie Generation, Delta Electricity and Eraring Energy) and the Gentraders who are the counterparties to the Gentrader contracts for each of Bayswater, Liddell, Eraring, Mt Piper, Vales Point and Wallerawang power stations.

A confidential copy of the draft Compensation Deed is attached as Confidential Annexure 1. A confidential term sheet setting out the key terms of the Compensation Deed is attached as Confidential Annexure 2.

2.4 The Generators

The Generators are statutory State Owned Corporations (***SOCs***) under the *State Owned Corporations Act 1989* (NSW) and the *Energy Services Corporations Act 1995* (NSW) and are trading corporations for the purpose of the TPA.[3]

Each Generator has two shareholders, one being the Treasurer and the other the Minister nominated by the Premier as a voting shareholder of the SOC.[4]

Delta Electricity

Delta Electricity (***Delta***) generates electricity from several facilities using a range of fuels including coal, water and biomass. Delta is currently one of the largest generators in the NEM, with over 4,300

[3] *State Government Insurance Corp v GIO (NSW)* (1991) 28 FCR 511
[4] *State Owned Corporations Act 1989*, section 20H

MW of capacity. Delta Electricity's share of NEM capacity, taking into account Colongra, is about9.2%.[5] Delta's corporate office is at Level 20, 175 Liverpool Street, Sydney, NSW.

Most of Delta's generation occurs at four coal-fired power stations, with the largest and newest being Mt Piper and Vales Point. Delta also has two older power stations, Wallerawang and Munmorah. Munmorah is included in the Gentrader model but will not be included in the co-insurance arrangement. These power stations are located in two distinct areas: Mount Piper and Wallerawang are located in central western NSW near Lithgow, while Vales Point and Munmorah are located on the Central Coast of New South Wales.

Delta's remaining generation comes from renewable energy sources such as mini-hydro generators and co-firing biomass. Delta is also in the process of constructing the Colongra peaking gas-fired power station (4 x 167 MW), adjacent to its Munmorah power station. Colongra, which will operate as a peaking plant, is expected to be commissioned during 2009. Colongra is included in the Gentrader model but excluded from the co-insurance arrangement.

The table below sets out Delta's power stations (for each of which a Gentrader contract will be written) and identifies the Gentrader bundles that will be offered with respect to those power stations.

Power station	Fuel	Capacity[6]
Delta Coastal Gentrader bundle		
Munmorah	Black coal	2 x 300 MW
Vales Point	Black coal	2 x 660 MW
Colongra[7]	Gas	4 x 167 MW
Total	-	2588 MW
Share of NEM capacity		4.9%
Delta West Gentrader bundle		
Wallerawang	Black coal	2 x 500 MW
Mt Piper	Black coal	2 x 700 MW
Total	-	2400 MW
Share of NEM capacity		4.4%
Total Delta	-	**4,988 MW**
Total share of NEM capacity		**9.2%**

Eraring Energy

Eraring Energy (***Eraring***) manages a portfolio of coal, hydro and wind generating assets across NSW. Eraring has a combined generating capacity of more than 3,000 MW. Eraring's generation portfolio

[5] Source: esaa, *Electricity Gas Australia*, 2009. These estimates are calculated by reference to NEM generation capacity for 2007-08.

[6] Share of NEM capacity is for 2007-08 (source: esaa, *Electricity Gas Australia*, 2009)

[7] To give a better understanding of Delta's share of total capacity, Colongra's capacity has been incorporated in Delta Coastal's capacity and in Delta's overall capacity, even though Colongra was not commissioned for 2007/08.

consists of 10 power stations and its share of NEM capacity in 2007-08 was 5.8%.[8] Eraring's corporate office is at Level 16, 227 Elizabeth Street, Sydney, NSW.

As set out in the table below, separate Gentrader contracts will be written for Eraring's Eraring baseload coal power station and Eraring's Shoalhaven hydro generation assets. These two contracts will be offered in a single Gentrader bundle, however the Shoalhaven hydro system will not be included in the co-insurance arrangement.

Power station	Fuel	Capacity[9]
Eraring Gentrader bundle		
Eraring[10]	Black coal	4 x 720 MW
Shoalhaven	Hydro	2 x 80 MW 2 x 40 MW
Total	-	**3120 MW**
Share of NEM capacity		**5.8%**

Macquarie Generation

Macquarie Generation owns and operates Liddell and Bayswater Power Stations, two of Australia's largest capacity thermal power stations. Macquarie Generation's corporate office is at 34 Griffiths Road, Lamdton, NSW.

The combined generating capacity of the Liddell and Bayswater Power Stations is 4,640 MW, representing about 8.9%of NEM capacity in 2007-08.[11] Macquarie Generation also owns and operates two 25 MW oil-fired gas turbines and a 0.85 MW mini-hydroelectric generator for peaking and emergency supply.

The table below sets out Macquarie Generation's power stations (for each of which a Gentrader contract will be written) and identifies the Gentrader bundles that will be offered with respect to those power stations.

Power station	Fuel	Capacity[12]
Liddell Gentrader bundle		
Liddell	Black coal	4 x 500 MW
Total	-	2000 MW
Share of NEM capacity		3.9%
Bayswater Gentrader bundle		
Bayswater	Black coal	4 x 660 MW
Total	-	2640 MW
Share of NEM capacity)		5.0%

[8] Source: esaa, *Electricity Gas Australia*, 2009
[9] Share of NEM capacity is for 2007-08 (source: esaa, *Electricity Gas Australia*, 2009)
[10] This is based on each of Eraring's four units being upgraded from 660MW to 720MW.
[11] Source: esaa, *Electricity Gas Australia*, 2009
[12] Share of NEM capacity is for 2007-08 (source: esaa, *Electricity Gas Australia*, 2009).

Power station	Fuel	Capacity[12]
Macquarie Generation total		**4,640 MW**
Total share of NEM capacity		**8.9%**

2.5 The Gentraders

The Gentraders will be the successful bidders for the five Gentrader bundles and will be the counterparties to the Gentrader contracts. As such the identities of the Gentraders are not known at this time and will not be known until final bids have been received, evaluated and awarded.

It is important that the coinsurance authorisation is in place for final bids. Based on the current timetable, the Government is aiming to receive final bids in the second quarter of 2009 with a view to selecting the successful bidders prior to the end of the financial year.

The Gentraders will carry on business trading the capacity of the power stations the subject of the Gentrader contracts. The nature of this is described more fully in sections 2.1 and 2.2 of the Competition Memorandum.

3. Application

3.1 Authorisation under Part VII of the TPA

This application for authorisation are made by the Treasurer, the Hon. Eric Roozendaal MLC, for and on behalf of Delta, Eraring and Macquarie Generation.[13]

This application is made under:

(a) section 88(1A) of the TPA for an authorisation to make and give effect to a contract, arrangement or understanding a provision of which would, or might be, a cartel provision within the meaning of Division 1 of Part IV of the TPA; and

(b) section 88(1) of the TPA for an authorisation to make and give effect to a contract, arrangement or understanding a provision of which would, or might:

  (i) be an exclusionary provision within the meaning of sections 4D of the TPA; or

  (ii) have the purpose or would or might have the effect of substantially lessening competition within the meaning of section 45.

3.2 Provisions of co-insurance arrangement for which authorisation is sought

Authorisation is sought for the co-insurance arrangement to be made and given effect to pursuant to the Compensation Deed. Specifically, authorisation is sought for the following features of the co-insurance arrangement:

- the payment provisions of the Compensation Deed specify the price payable (the "Compensation Price") for the compensation which a Gentrader is able to call on when the Generator is unable to meet its firm capacity requirements;

[13] This is consistent with the approach adopted for the South Australian vesting contracts authorisation, 22 December 1999 and NSW vesting contracts authorisation, 1 September 1999.

- the firm capacity provisions of the Compensation Deed specify the quantity of firm capacity to be made available by each Generator to its Gentrader counterparty for the purpose of the co-insurance arrangement;
- the allocation procedures and rules provided for in the Compensation Deed specify which Gentrader will be required to pay compensation and the amount of that compensation; and
- the supply and acquisition of the co-insurance provided pursuant to the Compensation Deed arrangement is limited to the parties to the agreement.

By entering into and giving effect to these provisions in the Compensation Deed, the parties to that Deed (being the Generators and the Gentraders) may be entering into and giving effect to a contract, arrangement or understanding a provision or provisions of which:

(a) would, or might be, a cartel provision within the meaning of Division 1 of Part IV of the TPA;

(b) would, or might be, an exclusionary provision within the meaning of sections 4D and 45; and/or

(c) which may have the purpose or would or might have the effect of substantially lessening competition in a market within the meaning of section 45.

For a more detailed description of these and other provisions see the Compensation Deed Term Sheet at Confidential Annexure 2 and the current draft of the Compensation Deed at Confidential Annexure 1.

3.3 Parties to be covered by the authorisation

This application is made on behalf of the Generators as parties to the Compensation Deed.

The Gentraders will also be parties to the Compensation Deed. Pursuant to section 88(6) of the TPA any authorisation granted by the Commission to a corporation to make or give effect to a contract, arrangement or understanding will have effect as if it were in the same terms to every other person named or referred to in the application for the authorisation as a party to the contract, arrangement or understanding or as a proposed party to the proposed contract, arrangement or understanding. The Gentraders are referred to in this application as proposed parties to the proposed Compensation Deed and the Minister requests that pursuant to section 88(6) the benefit of any authorisation granted extend to the Gentraders.

Section 88(10) of the TPA provides that an authorisation to a corporation under section 88(1) may be expressed so as to apply to or in relation to another person who becomes a party to the contract, arrangement or understanding after authorisation is granted. The Minister also requests that the authorisation be expressed so as to apply to or in relation to another person who becomes a party to the Compensation Deed by reason of a Gentrader novating their rights to another person. Under the Compensation Deed, a Gentrader may novate its rights and obligations under the Compensation Deed in relation to a Gentrader contract to which it is a party to another person if it is permitted to novate its rights and obligations under that Gentrader contract to that person. Under the Gentrader contract, a Gentrader will be permitted to assign the Gentrader contract with the consent of the counterparty to the Gentrader contract.

3.4 Period of authorisation

Authorisation is sought for a term of 10 years commencing from the date of commencement of the Compensation Deed, being the date on which all the Gentrader Contracts subject to the Compensation Deed are in force.

3.5 The proposed term of the co-insurance arrangement is discussed further in section 7 of Part C of this submission.

4. Criteria for authorisation

4.1 Statutory test

Pursuant to sections 90(5A), 90(5B) and 90(6) of the TPA, the Commission must not make a determination granting authorisation under section 88(1A) in respect of a provision (other than an exclusionary provision) of a contract, arrangement or understanding unless the Commission is satisfied in all the circumstances that:

(a) the provision would result, or be likely to result, in a benefit to the public; and

(b) that benefit would not outweigh the detriment to the public constituted by any lessening of competition that would result, or be likely to result, if the contract, arrangement or understanding were made and the provision given effect to.

(c) Pursuant to section 90(8) of the TPA, the Commission must not make a determination granting an authorisation under section 88(1) in respect of a provision of a contract, arrangement or understanding that is or may be an exclusionary provision unless the Commission is satisfied in all the circumstances that the proposed provision would result, or be likely to result, in such a benefit to the public that the proposed contract, arrangement or understanding should be allowed to be made and the provision given effect to.

Although the public benefit test for authorisation under section 90(8) means that authorisation may not be granted unless the public benefit outweighs any likely detriment, in most cases the only detriments likely to arise will be as a result of a lessening in competition. As such, the two authorisation tests, while expressed differently, essentially call for the same assessment.[14]

In terms of what constitutes a public benefit, the Australian Competition Tribunal has held:[15]

> Public benefit has been, and is, given a wide ambit by the Tribunal as, in the language of *QCMA* (at 17,242), "anything of value to the community generally, any contribution to the aims pursued by the society including as one of its principal elements (in the context of trade practices legislation) the achievement of the economic goals of efficiency and progress". Plainly the assessment of efficiency and progress must be from the perspective of society as a whole: the best use of society's resources.

Consistent with this, in considering the public benefits of the co-insurance arrangement it is important to have regard not only to the benefits associated with improved market outcomes, but also the benefits to the State and public of NSW.

4.2 Relevant markets

The relevant markets are:

(a) the NEM-wide wholesale market for the supply of electricity; and

(b) the retail market for the supply of electricity, being either an inter-regional market or a NSW-wide market.

In relation to the product dimension of the wholesale market, consistent with the approach adopted by the Federal Court in *Australian Gas Light Company v Australian Competition and Consumer Commission* (***AGL case***),[16] the NSW Government considers that there is a single wholesale market for

[14] *Australian Association of Pathology Practices Incorporated* (2004) ATPR 41-985 at 48,549-550; see also *Re Qantas Airways Ltd* [2004] ACompT 9 at [148]; ACCC, *Guide to Authorisation*, March 2007 at paragraphs 5.6-5.10.
[15] *Re 7-Eleven* (1994) ATPR 41-357 at 42,677.
[16] [2003] FCA 1525 at [387]

the supply of electricity and that there is not a separate market for the supply of electricity derivative contracts. However, even if it was assumed that there was a separate market for electricity derivative contracts, this does not change the analysis set out in this submission. If anything, the pro-competitive impact of the co-insurance arrangement is likely to be enhanced if considered in terms of a narrower market for electricity derivative contracts.

In terms of the geographic dimension of the wholesale market, again consistent with the approach adopted in the AGL case, the NSW Government considers that the relevant market is a NEM-wide wholesale market rather than a NSW market.[17] As with the product dimension of the market, if a narrower geographic market definition is assumed, the pro-competitive impact of the proposed co-insurance arrangement is likely to be enhanced.

In short, the NSW Government considers that the public benefits of the co-insurance arrangement clearly outweigh the limited anti-competitive detriments whichever market definition is adopted. In particular, for the reasons discussed further below, the co-insurance arrangement facilitates rather than impedes competition in wholesale and retail electricity markets.

The appropriate market definitions are discussed in greater detail in sections 4.2 (wholesale market) and 5.3 (retail market) of the Competition Memorandum.

4.3 Counterfactual

As set out above, co-insurance is a key element of the NSW Government's Energy Reform Strategy. In particular, co-insurance underpins the proposed transaction structure whereby the Generators' current generation portfolios will be disaggregated with the Gentrader contracts offered in five bundles. As such, the appropriate counterfactual for assessing the authorisation application is one where the Energy Reform Strategy is not implemented or, at the very least, not implemented as currently envisaged. This is consistent with the fact, as set out in the Competition Memorandum, that the reforms will be concurrently implemented as a single undertaking.

The analysis of the public benefits and detriments in Part C of this submission also considers the public benefits and detriments of the co-insurance arrangement as against the Energy Reform Strategy being implemented without the co-insurance arrangement. This analysis not only clearly demonstrates the public benefits and minimal anti-competitive detriments of co-insurance as against that counterfactual, but also demonstrates why co-insurance is a necessary element of the Energy Reform Strategy. In particular, without co-insurance the disaggregation of the Generators into the five Gentrader bundles is likely to increase the risk of unfunded difference payments. This would not only decrease the value of the Government's generation assets (thereby jeopardising the Government's value objectives) it is also likely to result in fewer firm contracts being made available in the NEM with consequential adverse impacts on wholesale and retail markets.

[17] Ibid

Part B: The co-insurance arrangement

1. Introduction

On 1 November 2008 the NSW Government announced an Energy Reform Strategy. An overview of the Energy Reform Strategy is provided in two NSW Government Strategy documents that have been publicly released.[18] A detailed overview of the Energy Reform Strategy, and a discussion of the reasons that the NSW Government considers that the reform process will deliver a competitive retail and wholesale electricity market, is set out in the Competition Memorandum.

An important aspect of the Energy Reform Strategy is the co-insurance arrangement developed by NSW Government. The co-insurance arrangement is designed to simultaneously achieve a number of public benefits. These are discussed in further detail in Section 1 of Part C below.

This Part B provides a detailed overview of the proposed co-insurance arrangement.

1.1 Policy objectives of the Energy Reform Strategy

The NSW Government's Energy Reform Strategy is designed to ensure that there is timely private sector investment in the electricity sector, thereby delivering affordable and reliable power to NSW businesses and households. Specifically, the Energy Reform Strategy is designed to:[19]

- deliver a competitive retail and wholesale electricity market in NSW to increase the potential for the sector to respond dynamically and innovatively to market forces and opportunities;
- create an industry and commercial framework to encourage private investment into the NSW electricity sector and reduce the need for future public sector investment in retail and generation;
- ensure NSW homes and businesses continue to be supplied with reliable electricity; and
- place NSW in a stronger financial position by optimising the sales value of public assets and reducing the Government's exposure to electricity market risk and reducing the State's public sector debt.

1.2 Key elements of the Energy Reform Strategy

In order to achieve the policy objectives set out above, the NSW Government's Energy Reform Strategy comprises a number of related reforms. Broadly, the Energy Reform Strategy consists of the following key elements:[20]

- continued Government ownership and operation of existing power stations and all electricity networks in NSW;
- contracting the electricity trading rights of State-owned power stations to the private sector, commonly referred to as the 'Gentrader' model;
- selling key power station development sites around the State; and
- selling the retail arms of EnergyAustralia, Integral Energy and Country Energy, including the retail brands.

[18] NSW Government, *NSW Energy Reform Strategy – Defining an Industry Framework*, March 2009; NSW Government, *NSW Energy Reform Strategy – Delivering the Strategy*, September 2009.
[19] NSW Government, *NSW Energy Reform Strategy – Delivering the Strategy*, September 2009.
[20] NSW Government, *NSW Energy Reform Strategy – Delivering the Strategy*, September 2009.

It is important to understand a few key features of the Gentrader contract to appreciate the operation and benefits of the co-insurance arrangement. The details of the Gentrader contract will remain confidential to the contracting parties, as all similar contracts are in the market.

Fundamentally, the Gentrader contract establishes the rights and obligations on the State-owned Generator as the producer of electricity and the Gentrader as the seller of the power and purchaser of key inputs (such as fuel). In the NSW context, the Generators will be the three existing State-owned generation businesses, which will remain in public hands. The Gentraders will be the private sector entities that are successful bidders to acquire the right to trade the capacity of the Generators.

The Gentrader contracts developed by the NSW Government are physical contracts. That is, the contract provides for the physical delivery of power as distinct from a contract that is financially settled against a reference (spot) price. Under this arrangement the Gentraders have control over all NEM participation decisions regarding the dispatch of the Generators' power stations into the wholesale market. The Gentraders will be responsible for decisions regarding the quantities and the prices at which the power stations are to be bid into the market, and will receive the revenues for dispatch in the market. The Gentraders will also be responsible for decisions regarding hedging contracts backed by the power stations and any other means.

The Gentrader contracts will be at the individual power station level. That is, there will be a separate Gentrader contract for each of the nine significant State-owned generation stations. However, the Gentrader contracts will be offered to the market in five Gentrader bundles:

- Delta Coastal Gentrader bundle – consisting of Munmorah, Vales Point and Colongra.
- Delta West Gentrader bundle – consisting of Wallerawang and Mt Piper.
- Eraring Gentrader bundle – consisting of Eraring and Shoalhaven.
- Liddell Gentrader bundle – consisting of Liddell.
- Bayswater Gentrader bundle – consisting of Bayswater.

The Gentrader contracts are discussed in more detail in Section 2.

1.3 Co-insurance

One of the benefits to a generator of having a portfolio of generation plant is that the generator is better able to manage unit outages across a portfolio than with a single plant. With the three existing State-owned generation portfolios offered to the market as five Gentrader bundles, the owners of the trading rights are likely to be less able to manage plant outages than would be the case with larger bundles.

For generators who have entered into financially firm contracts, one consequence of plant outages is the risk that they face in making contract payments that are not funded by offsetting pool earnings (known as unfunded difference payments). One of the key methods generators use to manage the risk of unfunded difference payments is to limit the quantity of financially firm contracts they sell to retailers. This generator behaviour tends to increase the price of firm hedges as well as expose retailers to greater market risk, particularly as system reserves tighten, as they will do increasingly over coming years. One way that retailers can respond to this risk – at least in the long-term – is by building or acquiring their own generation plant. This acts as a form of hedging cover to make up for the shortfall in affordable firm financial contracts. This retailer behaviour increases the difficulties faced by existing generators in recovering their capital costs and can inefficiently increase the resources required to supply electricity to consumers.

For these reasons, along with the others described above, the NSW Government proposes to implement a co-insurance arrangement alongside the Gentrader contracts.

1.4 This part

This Part of the submission provides a detailed overview of the proposed co-insurance arrangements. This Part is structured as follows:

- Section 2 provides an overview of the Gentrader contracts;
- Section 3 provides an overview of the co-insurance arrangement;

Further details regarding the co-insurance arrangement are set out in Appendix 1 to this submission:

- payments that occur under the co-insurance arrangement including worked examples (Section 1);
- the arrangements for calling on co-insurance and supplying co-insurance (Section 2); and
- methodology for determining the firm quantity under co-insurance (Section 3).

2. Overview of Gentrader contracts

As identified above it is important to understand a few key features of the Gentrader contract to understand the operation and benefits of the co-insurance arrangement. This section provides an overview of those aspects of the Gentrader contracts that are relevant to the co-insurance arrangement, including capacity and availability arrangements.

A more general discussion of the Gentrader contracts, and the NSW Government's view on the competition implications of the Gentrader contracts, is provided in the Competition Memorandum.

2.1 Gentrader arrangements

The Gentrader arrangements proposed as the basis of reforming electricity generation in NSW is a particular version of a model widely used both in Australia and overseas. The essential feature of the Gentrader arrangements is that it creates a functional separation between the ownership of the generation asset and the ownership of contractual rights to trade the capacity of the asset in the wholesale electricity market.

The entity that owns and operates the power stations is referred to as the Generator, and the entity that owns the trading rights as the Gentrader.

In the NSW context, the Generators will be the three existing State-owned generation businesses, which will remain in public hands. The Gentraders will be the private sector entities that are successful bidders to acquire the right to trade the capacity of the Generators.

The key to understanding the operation of the Gentrader arrangements, and the competition consequences, lies in understanding how the Gentrader contracts are structured. The sections that follow discuss key terms of the Gentrader contracts. In designing the Gentrader contracts, a key objective has been for the Gentrader to face a set of circumstances, and a set of incentives, as close as possible to those it would face if it were both owner of the trading rights and owner of the generation asset. In this way, the Gentrader would be expected to behave in the market as if it were the owner of the generation asset, and the outcomes in the market would be expected to be the same as if the Gentrader were the owner of the generation asset. For these reasons, the NSW Government considers that competition benefits are not diminished by the fact trading rights are transferred to the private sector through the Gentrader contract, as opposed to a transfer of ownership of the power station assets to the private sector.

2.2 Gentrader contracts are physical

The Gentrader contracts are physical contracts rather than financial contracts.
Under a physical contract, the Gentrader has control over all decisions regarding the dispatch of the Generators into the wholesale market. The Gentrader will be responsible for decisions regarding the quantities and the prices at which the Generator is to be bid into the market, and will receive the revenues for dispatch in the market. The Gentrader will also be responsible for decisions regarding hedging contracts backed by the power station. Under a physical contract, therefore, the Generator is not responsible for any decisions regarding the sale of electricity or the sale of hedging contracts.

2.3 Size of contracts

As set out in the Strategy Document, the Gentrader contracts will be at the individual power station level. That is, there will be a separate Gentrader contract for each of the State-owned generation stations.

2.4 Capacity and availability in the Gentrader contracts

The Gentrader contracts provide for the dedication of the contract capacity of the power station to the Gentrader. The extent to which the contract capacity is made available to the Gentrader is governed by the availability regime under the Gentrader contract.

Capacity

The Gentrader contracts provide for the dedication of the contract capacity of the power station to the Gentrader. This means that the Gentrader will be able to dispatch the contract capacity of the power station, subject to the availability regime.

The Gentrader contracts also provide the Gentrader with exclusive rights over the capacity of the power station during the contract term. This means that the Generator will be unable to offer rights over capacity from the power station to any person other than the Gentrader.

Availability regime

The contract capacity dedicated to the Gentrader under the Gentrader contract is not firm on the half-hour. Rather, the Gentrader's right to dispatch the contract capacity will be subject to the availability regime under the Gentrader contract. The availability regime accounts for both scheduled outages (planned outages) and unscheduled outages (forced outages).

Target availability

The Gentrader contracts set out an availability target. The availability target will be in the form of an equivalent availability target, measuring the equivalent availability delivered from the contract capacity of the power station over a defined period consisting of a number of months (as opposed to the firm half-hourly availability provided over a proportion of contract capacity under the co-insurance contract).
The availability target under the Gentrader target will be separately defined for like periods consisting of, for instance, working weekday peak periods, working weekday off-peak periods, and non-working weekdays.

Actual availability

The Gentrader contracts set out a method for calculating actual availability. Actual availability will be calculated for the same like periods as the availability targets are defined. So, for instance, where target availability is set for working weekday peak periods, working weekday off-peak periods, and non-working weekdays, actual availability will be calculated separately for these same periods.

Actual availability will be calculated each month, for each like period, over a rolling number of months. For instance, actual availability for peak working weekday periods may be calculated over the preceding three months. These three monthly calculations will then be compared to the target availability.

Not all losses of availability from the power station will be reflected in the calculation of actual availability:

- The calculation of actual availability will reflect, among other things, the loss of availability resulting from any unscheduled outages.
- The calculation of actual availability will not reflect, among other things, the loss of availability resulting from permitted scheduled outages, force majeure events, and network failures.

Treatment of scheduled outages

Scheduled outages that are planned for any contract year will be scheduled in advance of that contract year. Each year, the Generator will provide the Gentrader with a proposed outage schedule for the following contract year and an indicative outage schedule for a number of contract years after that. The proposed outage schedule for the following contract year must comply with a set of requirements and principles set out in the Gentrader contract. These requirements and principles will include a maximum

period of time for the completion of all scheduled outages. The Gentrader will have the opportunity to negotiate amendments to the Generator's proposed outage schedule, with the outage schedule to be resolved through a dispute resolution mechanism if agreement cannot be reached.

Once an outage schedule for a contract year is agreed between the Generator and the Gentrader, or otherwise determined, the outage schedule becomes binding. The Generator must use its reasonable endeavours to only conduct a scheduled outage in accordance with the outage schedule. Scheduled outages that are undertaken in accordance with the outage schedule are not counted as a loss of availability under the Gentrader contract.

Treatment of unscheduled outages

Unscheduled outages, and scheduled outages that extend beyond the scheduled period, are losses of availability that will be reflected in the calculation of actual availability. As a result, if the power station is subject to significant unscheduled outages, the power station's actual availability will be low.

Availability bonuses and availability liquidated damages

Where the actual availability of a power station for a period is higher than the target availability for the power station for that period, the Gentrader contract will provide for an availability bonus to be paid by the Gentrader to the Generator.

Where the actual availability of a power station for a period is lower than the target availability for the power station for that period, the Gentrader contract will provide for availability liquidated damages to be paid by the Generator to the Gentrader.

The availability bonuses and availability liquidated damages are designed to provide an incentive for the Generator to be available, and to compensate the Gentrader for losses it faces as a result of reduced availability. The availability bonuses and availability liquidated damages need not be symmetrical.

2.5 Term of the Gentrader contracts

The term of the Gentrader contracts will be equal to the remaining technical life of the power stations. For some of the power stations included in the Gentrader arrangements, the technical life extends out towards 2040. The approximate technical life of each of the power stations is set out in the Competition Memorandum.[21]

3. Overview of co-insurance arrangement

This section provides an overview the key features of the proposed co-insurance arrangement. Where necessary, subsequent sections of this report provide more detail about specific elements of the arrangement.

3.1 Overview

The co-insurance arrangement is put in place through the Compensation Deed, a multi-lateral contract between the Gentraders and Generators.

The Compensation Deed is a financial contract rather than a physical contract. For Gentraders, the co-insurance arrangement is, in many respects, similar to a firm swaption. Co-insurance will be a purely financial arrangement. In the event of a plant outage, as determined by the Generator, the Gentrader affected by the outage has the option to call on co-insurance up to a pre-determined firm capacity level (referred to as the firm capacity throughout this report). If co-insurance is called, the affected Gentrader receives difference payments in respect of the called quantity, just like under a cap contract. The strike price of the contract (i.e. the Compensation Price) is referred to in this submission as the co-insurance price (P_{CI}) and will be set at some level above marginal cost of the most expensive

[21] Table 1, page 13.

Generator (including carbon costs). The quantity under this contract will be the nominated amount up to the pre-determined firm capacity.

Gentraders may be called upon to supply co-insurance to Gentrader(s) suffering an outage. Which Gentraders are called upon to supply co-insurance will be decided via an allocation rule, which is discussed in more detail in Appendix 1, section 2. The responding Gentrader will effectively be on the other side of the 'swaption' called by the affected Gentrader. The quantity will never exceed the non-firm capacity of the supplying Gentrader (where the non-firm capacity is the total capacity less firm capacity).

Because the co-insurance contract is a financial contract, it does not interfere with Gentraders' freedom to dispatch their power stations under the Gentrader contract. Gentraders affected by an outage will still be able to dispatch the remaining available capacity of their power station into the market as they choose, and Gentraders supplying co-insurance will still be able to dispatch the available capacity of their power station (both firm and non-firm). Generators will continue to operate in accordance with the dispatch decisions of their Gentraders.

One possible consequence of the co-insurance arrangement is the restrictions that may be placed on the Gentraders to contract their non-firm capacity. Gentraders may be reluctant to contract this capacity to account for the possibility of having to forego pool revenues above their costs to firm up another Gentrader. However, as discussed in Part C below, the Government considers that these restrictions will be more than outweighed by the additional firm contracts that could be offered by the pool of the spare capacity of the 18 generating units across the State's portfolio included in the scheme. The additional capacity that could be secured through this scheme as compared to Gentraders acting individually is discussed in Section3 of Appendix 1.

3.2 Eligible plant

The co-insurance arrangement will apply only to the following State-owned baseload power stations – Bayswater, Liddell, Eraring, Mt Piper, Vales Point B and Wallerawang.

Other State-owned power stations that are included in Gentrader bundles are however excluded from the co-insurance arrangement:

- Munmorah will be excluded because of its imminent retirement;[22]
- Colongra will be excluded because, being a peaking power station, it has a significantly higher marginal cost than the baseload power stations. Including Colongra would mean that the co-insurance arrangement would cover Gentraders at a significantly higher strike price, as the co-insurance price must exceed the marginal cost of all plant that are covered. This will be discussed in greater detail in Section 1; and
- Shoalhaven will be excluded because of the inclusion of an energy constrained plant significantly complicates the co-insurance arrangement for very little gain given the small amount of energy produced by this station.

3.3 Contract duration and termination

The Compensation Deed will be for a fixed term of 10 years. This will provide sufficient time for new entrant Gentraders, or Gentraders with limited access to additional existing capacity, to pursue alternative strategies to manage the risk of unfunded difference payments, such as building additional generating capacity.

[22] Munmorah's estimated technical life is 2013/14.

Any shorter time than 10 years will mean that it will be difficult for new entrants to significantly benefit from the scheme and will undermine the Government's attempts to encourage new entrant bidders for Gentrader bundles.

The appropriateness of the 10 year term is discussed further in Part C, Section 7 below.

It should be noted that the operation of co-insurance means that acquirers of the Gentrader bundles will not lose the risk-management benefits provided by the co-insurance arrangement if they decide to sell part of the Gentrader bundles (i.e. by selling one of the Gentrader contracts they acquired as part of the Gentrader bundle). The co-insurance arrangement allows a stand-alone Gentrader to contract, more or less, the same way as if it were part of a larger portfolio of plants. If the co-insurance arrangement does not run its full length this may dissuade further new entrants from acquiring part of a Gentrader bundle as it would be difficult for them to compete with existing portfolio generators.

However, provision has been made to allow the co-insurance arrangement to be terminated sooner than the 10 year period in two cases, either:

- the Gentraders party to the Compensation Deed decide under a super majority vote to end the arrangement prematurely. This is structured so that a smaller new entrant could not be denied ongoing benefit to the scheme by block voting of incumbent generators who do not value the scheme as much as a new entrant or who wish to increase the costs of a new entrant; or
- some unforeseen event leads to a significant number of generating units failing such that there is not enough capacity to support co-insurance.

The second event is considered to be extremely unlikely to occur within the 10 year period.

3.4 Availability and firmness

The operation of the Gentrader contract is not affected by the co-insurance arrangement. This is a necessity since the term of the co-insurance arrangement is shorter than the terms of Gentrader contracts.

As discussed in Section 2, under the Gentrader contracts, Gentraders receive a defined level of availability from their power stations. However, this availability is not defined on a half-hourly basis, so the Gentrader contracts are not firm on the half-hour. It is only if the power station does not meet the defined level of availability over a period of time in breach of the Gentrader contract, that the Gentrader will receive penalty payments from the Generator.

As mentioned above, the co-insurance arrangement is designed to provide each Gentrader with a defined level of firm capacity. Gentraders are able to call on co-insurance if the availability they receive through the Gentrader contract at any point in time does not meet this defined level of capacity. A consequence of the Gentraders being provided with a defined level of firm capacity is that their remaining non-firm capacity (the difference between the defined level of firm capacity under the Compensation Deed and the total contract capacity under the Gentrader contract) may be required to support co-insurance payments from time to time.

Where Gentraders call on co-insurance, the called amount is counted as availability under their Gentrader contract. This reduces the likelihood that the Generators will be liable to pay penalties for breaching the defined level of availability under the Gentrader contracts. This reduction in the risk of paying damages to Gentraders is an important feature of the arrangements in terms of achieving the Government's policy outcomes of reducing taxpayer exposure to electricity market risk. It is important to note that if the Generators are exposed to undue risk of damages to Gentraders due to failure to meet availability targets, this will induce them to manage this risk through various means of insurance, including developing a physical position in the market. This would be counterproductive to the policy aim of extracting the Government from the electricity market.

A Generator that is not experiencing an outage and is supplying co-insurance will be considered to be fully available for the purposes of calculating availability under the Gentrader contracts. By design, supplied co-insurance counts as 'availability' under the Gentrader contract for the supplying Generator and under the Gentrader contract for the receiving Generator.

3.5 Setting the firm capacity

The firm capacity provided under the co-insurance arrangement is calculated to account for the probability of outages. The intention is to set the firm capacity at a level that can be supplied on a firm basis by the power stations party to the co-insurance arrangement, and at low risk that power station outages will prevent the firm capacity being available across the power stations party to the co-insurance arrangement.

Firm capacity can be set to account for forced outages only, planned outages only or for the combined probability of both. The co-insurance arrangement will not differentiate between forced and planned outages due to the difficulties in differentiating between the two outage causes. In practice, it is virtually impossible to determine the cause of an outage. For example, an Generator may claim a forced outage when in reality the outage is being taken to conduct planned maintenance, or an outage may begin as a forced outage but the Generator then decides to bring forward planned maintenance. By not distinguishing between the differing causes of outages this issue is avoided in the co-insurance arrangement.

Having co-insurance cover both planned and forced outages is also likely to be more valuable to Gentraders, particularly new entrant Gentraders, because it provides an opportunity to manage both planned and forced outages.

For these reasons the firm capacity will be set to reflect the probability of both forced and planned outages. This also means that the firm capacity can be set at a constant level for each power station for each year of the contract as opposed to having seasonal variations in the level of cover, obviating the need for the co-insurance arrangement to be prescriptive about when scheduled maintenance should occur. Arrangements for the timing of scheduled maintenance are provided for the Gentrader contract, with both the Gentrader and Generator retaining incentives to conduct scheduled maintenance during low demand times (the Gentrader in order to have access to its non-firm capacity during high demand times, and the Generator in order to minimise the risk of making co-insurance payments).

[RESTRICTION OF PUBLICATION OF PART CLAIMED]

The actual level of firm capacity will ultimately be determined with regard to the expected physical capabilities of the power stations over the term of the Compensation Deed and the availability provided for in the Gentrader contracts. It is the physical capabilities of the power stations and the availability provided for in the Gentrader contracts will determine the risk associated with the a given level of firm capacity under co-insurance. Until the expected physical capabilities of the power stations over the term of the co-insurance and the availability provided for in the Gentrader contracts have been settled, the level of firm capacity provided for under co-insurance cannot be settled.

The calculations that will be used to determine firm capacity under the co-insurance arrangement are discussed in more detail in Section 3 of Appendix 1.

3.6 Scheme administration

The co-insurance arrangement requires an Administrator to govern the arrangements. The principal activity of the Administrator will be to allocate the supply of co-insurance in the event of a call on the contract and to keep track of the supply and demand of co-insurance over the duration of the contract. The Administrator will be a NSW Government entity.

3.7 Calling rules

The option of calling on co-insurance commences with an outage occurring at one of the power stations, such that the power station availability under the Gentrader contract is less than the firm capacity for that power station as defined under the Compensation Deed.

Generators declare their available capacity under terms of the Gentrader contract. These availability declarations are also made available to the Administrator. If an Generator's availability declaration is lower than the firm capacity defined under the Compensation Deed, then the associated Gentrader can choose to call co-insurance for the difference between firm capacity and available capacity.

If a call is made on co-insurance, then allocation rules are applied to determine which Gentrader(s) supply the co-insurance. Payments become active two full trading intervals from the time the call is made. The affected Gentrader is not covered by co-insurance for the two interim intervals, as would be the case in the absence of co-insurance. For example, if a call is made by the affected Gentrader at 12:15pm then the co-insurance payments would become active from the interval ending at 2:00pm and continue until the affected Gentrader rescinds the call or its Generator's availability declaration is again in excess of the Gentrader's firm capacity. From the time of the call, and for the two interim intervals (12:15pm to 1:30pm), the affected Gentrader incurs the cost of the outage with no financial compensation under co-insurance.

3.8 Payments

When the co-insurance arrangement is activated, financial payments between parties occur. The net effect of these payments is that the Gentraders suffering loss of firm capacity are compensated for lost pool operating profit up to their firm capacity. Unaffected Gentraders (i.e. the Gentrader that responds to the outage event) that supplies co-insurance, supports these payments by surrendering operating profits on some of all of their non-firm output, as required. Of course, all Gentraders benefit from co-insurance firming up their capacity.

Whilst the net effect of the Gentrader payments is a transfer from supplying Gentraders to receiving Gentraders, the actual payments are made to and from each Gentrader's relevant Generator rather than directly between Gentraders. This means that potential Gentrader bidders do not need to consider the potential identity of other Gentraders in so far as it relates to the counter-party credit risk associated with co-insurance.

Finally, in the event of multiple simultaneous outages, it is possible that the demand for co-insurance may exceed available supply. In this case financial payments do not apply for the unmet demand for co-insurance and the affected Gentraders bear the risk. To the extent that these events occur and there is unserved demand for co-insurance, the co-insurance arrangement is pseudo-firm (i.e. it will not be available every half-hour).

These payments are discussed in detail in Section1 of Appendix 1.

3.9 Allocation

In the event of co-insurance being called there needs to be some method of determining which Gentrader supplies co-insurance. The allocation method developed for the co-insurance arrangement, called the surplus/deficit order, is arranged so that the Gentrader who has called on co-insurance the most is the first to supply co-insurance to any other Gentrader.

Under this system Gentraders accrue deficit MWhs when calling on co-insurance and surplus MWhs when supplying co-insurance. In the event that a call is made, the non-calling Gentrader with the highest deficit is the first to supply and so on down the order.

The allocation rule is discussed in more detail in Section2 of Appendix 1.

3.10 Incentives

The payment structure under co-insurance correctly aligns the incentives of Gentraders and Generators.

As discussed above, affected Gentraders receive revenues from exercising their option to call on co-insurance such that they effectively earn pool operating profits up to their firm capacity in the event of an outage. Supplying Gentraders forego pool operating profits above their firm capacity. This is what funds the co-insurance arrangement. The net effect is that all Gentraders can consider a larger proportion of their capacity firm than would be the case in the absence of co-insurance. This gain is supported by Gentraders foregoing pool operating profits on non-firm capacity when called upon.

This effect is particularly important for the smaller Gentrader bundles – particularly the Delta Coastal Gentrader bundle and the Delta West Gentrader bundle – as these bundles have a reduced ability to self-insure against forced outages and planned maintenance. It also provides potential new entrants to the NEM with a pre-existing method to manage the risk of unfunded difference payments. This is especially important for new entrants because they do not have the benefit of pre-existing NEM generation assets, and therefore are least able to manage the risk of unfunded difference payments. The same is also true for bidders with only small or passive investments in existing NEM generation assets.

The co-insurance arrangement provides incentives to both Gentraders and Generators to maintain the reliability of their power stations. Gentraders benefit from more reliable power stations because they will be able to better retain non-firm operating profits. Generators benefit from reliable power stations because it reduces the co-insurance payments that they are required to make during an outage and increases the chance that they will supply co-insurance and receive payments.

The Government, as owner of the Generators, is indifferent to transfers between Generators, meaning that co-insurance payments balance out as far as the Government is concerned. Importantly though, individual Generators stand to gain or lose from the arrangements so the commercial Boards of these corporations will be concerned about their availability and the costs to them of calling for co-insurance support. Furthermore, the presence of the co-insurance arrangement reduces the likelihood of penalty payments for not achieving the operating envelope defined under the Gentrader contracts.

Part C: Public benefits of co-insurance

Introduction

The co-insurance arrangement is a key element of the Energy Reform Strategy and has been designed by the NSW Government in order to promote the NSW Government's reform objectives. As set out in the Competition Memorandum, co-insurance:

- manages the impact on contract markets that might otherwise result from splitting the existing portfolios into smaller Gentrader bundles;
- enables the NSW Government to offer an increased level of availability for a given expectation of making penalty payments under the Gentrader contracts, thereby allowing the NSW Government to offer more valuable Gentrader contracts to the market; and
- provides Gentraders with firm capacity that would otherwise not be available under the Gentrader contracts, which is likely to be particularly important to new entrants, entering the NEM without an existing portfolio of generation to help manage outage risk.

The purpose of this Part of the submission is to set out these and other public benefits of the co-insurance arrangement in further detail, and explain how the co-insurance arrangement promotes the NSW Government's reform objectives. This includes a discussion of:

- the relationship between co-insurance and the Energy Reform Strategy (see Section 1);
- the benefits from improved outcomes in wholesale electricity markets (see Section 3);
- the benefit from improved outcomes in retail electricity markets (see Section 4);
- the benefits of the co-insurance arrangement to the State of NSW (see Section 5); and
- the benefits of the co-insurance arrangement to successful bidders for Gentrader bundles (see Section 6).

Because of the relationship between the co-insurance arrangement and the incentives that the owners of trading rights have to enter firm financial contracts, section 2 of this report contains a discussion of contracting behaviour in wholesale electricity markets.

This Part also considers the duration of the co-insurance arrangement (see Section 7) and sets out the reasons why the NSW Government considers that the co-insurance arrangement results in limited anti-competitive detriment (see Section 8)

1. Co-insurance is a key element of the energy reform strategy

Co-insurance is a key element of the Energy Reform Strategy and, as such, helps deliver the public benefits of that Strategy. These include:

- delivering a competitive retail and wholesale electricity market in NSW to increase the potential for the sector to respond dynamically and innovatively to market forces and opportunities;
- creating an industry and commercial framework to encourage private investment into the NSW electricity sector and reduce the need for future public sector investment in retail and generation;
- ensuring NSW homes and businesses continue to be supplied with reliable electricity; and

- placing NSW in a stronger financial position by optimising the sales value of public assets and reducing the Government's exposure to electricity market risk and reducing the State's public sector debt.

The co-insurance arrangement is designed to simultaneously achieve the above public benefits by:

- Preserving one of the key benefits of having a larger portfolio of generating plants – the management of financial contracting risk associated with plant outages – while splitting the three Generators into five Gentrader bundles. This will promote the development of a more competitive generation market without diminishing retailers' access to financially firm hedging contracts that would otherwise occur from creating a larger number of smaller, separate Gentrader bundles. This aspect of the co-insurance arrangement is particularly valuable to any new entrants that do not have the advantage of an existing portfolio of generation plant to help manage the risk of contracting. In this regard the co-insurance arrangement is consistent with the Government's strong desire to actively encourage new generation and retailer entrants to the NEM;

- Lowering the risk to the Government from providing a given quantity of firm capacity, which assists in achieving one of the policy aims of the Government – to shift electricity market risk to the private sector;

- Allowing the Gentraders to collectively offer more financially firm contracts into the market for a lower level of risk than if each offered the same quantity of contracts independently. All other things being equal, this should increase the availability of financially firm contracts and ease entry conditions for new retailers; and

- Sharpening the incentives on State-owned Generators to improve their availability, as Generators calling on co-insurance will have to pay for the services of the reliable Generators that meet their shortfall in firm capacity. This will also encourage the Gentraders to invest in improving the reliability of unreliable Generators.

The co-insurance arrangement is an integral part of the Energy Reform Strategy, and the package of reforms has been designed to reflect the operation of the co-insurance arrangement. In the absence of the co-insurance arrangement, the implementation of other aspects of the reforms will need to be reconsidered:

- In the absence of co-insurance, the impact on contracting behaviour (and ultimately on outcomes in wholesale and retail markets) as a result of offering a larger number of smaller Gentrader bundles will likely be material. One option for mitigating the impact on contracting behaviour in the absence of co-insurance would be to allow rebundling of Gentrader assets.

- In the absence of co-insurance, there will be an increased risk to the State-owned Generators of a making availability damages payments for any given level of availability under the Gentrader contracts. One option for mitigating this increase in risk would be to define a lower level of target availability under the Gentrader contracts, with implications both for the wholesale market outcomes and for the ability of the Government to meet its value objectives.

2. Contracting in the wholesale electricity market

Spot electricity prices are volatile over time. This volatility results in significant uncertainty in the wholesale electricity market, which can create problems both for generators and retailers: generators, because they face substantial fixed costs and need some certainty that they will earn sufficient revenue to recover these costs; retailers, because they typically offer customers fixed electricity prices and need some certainty that they will be able to acquire electricity at a price below that fixed price. An important way for generators and retailers to manage this uncertainty is through financial hedging contracts.

This section provides some general background to contracting behaviour in the wholesale electricity market. In particular, this section highlights the importance of firm contracts in the wholesale electricity market, and the way that generators manage some of the risks created by contracting.

2.1 Retailers' contracting preferences

As discussed, while wholesale spot electricity prices are volatile over time, the vast majority of final electricity consumers prefer to have electricity prices that are fixed over time. For a large number of customers this is because electricity costs are not substantial relative to the costs involved in responding to variable spot prices (for instance, electricity generally represents less than 2 per cent of the household budget).

If retailers offer customers fixed price electricity contracts, they face the risk that the costs of buying electricity from the volatile spot market will exceed the revenues they earn from their customers. Retailers manage this risk by entering into financial contracts that provide insurance (hedge) against the possibility that they will pay more for the electricity than the revenue they receive from customers. For the vast majority of these financial hedging contracts the counterparty to the retailer is a generator.

There is a wide range of financial hedging contracts that are used in the electricity market. At one level these contracts can be categorised as either financially 'firm' or 'non-firm':

- Financially firm contracts are active all the time. That is, financially firm contracts do not contain terms that place conditions on when the counterparties will make payments to make up the difference between the spot price and the agreed strike price in the contract (known as contract difference payments). For this reason financially firm contracts are sometimes known as 24-7 contracts (i.e. active 24 hours a day, 7 days a week).

- Financially non-firm contracts contain terms that place conditions on when contract difference payments will be made. Typically, a non-firm contract will include terms that state that a generator will only be required to make contract payments to a retailer if the generator has sufficient plant available to be dispatched into the market.

Retailers typically prefer firm contracts. All other things being equal (most notably the strike price of the contracts), retailers prefer firm contracts because non-firm contracts can result in the retailer being exposed to higher spot prices at times when consumer demand is high, thereby increasing the chance that their energy purchase costs will exceed the revenue earned from customers. Given the slim margins that retailers earn in the highly competitive retail sector, very few retailers will take the risk of non-firm contracts. And, for the same reason, retailers will pay a premium for greater contract firmness.

2.2 Generators' contracting preferences

While retailers seek to hedge the risk that the spot electricity price will be greater than the fixed retail price, generators seek to hedge the risk that the spot electricity price will be insufficient to recover the generators' fixed costs.

However, while retailers prefer firm contracts, generators typically prefer non-firm contacts. All other things being equal (most notably the strike price of the contracts), generators prefer to offer retailers financially non-firm contracts because it is less risky for the generator.

For each additional financially firm hedge contract a generator signs, the level of financial risk rises. This is because generators face a risk that they may not be able to fund their contract payments (when the spot price rises above the strike price) with offsetting revenue earned from the pool. This is known as an unfunded difference payment risk. An unfunded difference payment would typically occur if a generator has an outage at one or more of its units, and has signed firm contracts in excess of its remaining capacity to generate.

Generators attempt to manage this risk in a variety of ways including, for example:

- seeking to put clauses in their contracts that link contract payments to times when their plant is available (i.e. making contracts non-firm); and/or
- limiting the firm contracts they sell to match their expectation of their firm generation capability; and/or
- organising a contract with another party to hedge against the risk of unfunded difference payments (i.e. co-insurance), the costs of which they seek to recover in the price of the contracts to the initial counterparty; and/or
- operating their plant under circumstances that they would otherwise choose not to make their plant available (e.g. delaying maintenance), typically increasing long-term generation costs, which will be passed through to contract prices; and/or
- charging more for contracts to reflect the costs of assuming more risks.

Of these options for managing unfunded difference payment risk, the second is the most commonly used. In crude terms, generators will tend to sign financially firm contracts limited to the capacity of all their generation units less their largest unit (this is commonly known as the *n-1* rule, where *n* is the number of generation units). So, if a generator has four 500 MW generating units it will tend to sign financially firm contracts limited to 3 x 500 MW (1,500 MW) and leave 500 MW free to manage unfunded difference payment risks. The generator will then typically agree to non-firm contracts in respect of some of the 500 MW 'held out' unit. In this example, 75 per cent of capacity is contracted on a firm basis and 25 per cent is not.

3. Benefits from improved outcomes in the NEM wholesale market

The benefits of the co-insurance arrangement at the wholesale level derive from the improved market outcomes from disaggregation of the generation portfolios, encouragement of new entry and facilitation of increased liquidity for firm contracts. The co-insurance arrangement is also likely to facilitate more efficient generation investment decisions than would otherwise be the case.

3.1 Structural factors

With the trade-off between portfolio size and the risk of unfunded difference payments, co-insurance is important to the NSW Government's ability to balance its competition objectives with its value objectives in the design of the Energy Reform Strategy. Co-insurance facilitates the offering of five Gentrader bundles (instead of a smaller number) without increasing the risk of unfunded difference payments that would otherwise accompany this decision. As noted above, such an increase in the risk of unfunded difference payments would tend to reduce the volume of firm contracts that Gentraders would be willing to enter into for a given level of risk, potentially decreasing the value of the Government's generation assets and making it difficult to meet the Government's value objectives. As such, the co-insurance arrangement is an important aspect of the Government's ability to promote a competitive wholesale market structure in the NEM that should contribute to promoting competitive wholesale market outcomes. The NSW Government believes that this will also improve the competitive conditions for the retail market.

3.2 Encouraging new generation entry

As discussed in the Competition Memorandum, the Energy Reform Strategy has been designed to encourage new entry into the NEM. Indeed, the sale process has been designed to ensure the emergence of at least one new generation entrant.

The Government considers that the co-insurance arrangement is important in encouraging participation by new entrants. This is principally because in the absence of co-insurance new entrants will be in a far

worse position to self-insure against the risk of unfunded difference payments than existing market participants:

- New entrants will, by definition, not have existing generation assets in the NEM or will have only limited interests in such assets, and will therefore be unable to manage the risk of unfunded difference payments across part of a larger portfolio.
- New entrants will be in a poor bargaining position, relative to incumbent generators, in any negotiation to develop a co-insurance arrangement following the completion of the transaction process.
- New entrants are likely to be less familiar with the NSW power stations than incumbent generators, and therefore in a worse position to assess the likely performance of particular Gentrader bundles. The management of the risk of unfunded difference payments provided by the co-insurance arrangement will provide new entrants with a measure of insurance against poor performance by specific power stations.

The participation of new entrants in the sale process is important for the Government's competition objectives. A new entrant acquiring a Gentrader bundle will increase the competitiveness of outcomes in the wholesale market by introducing what will essentially be a new supplier into the NEM. A new entrant acquiring a Gentrader bundle is also likely to promote competitive outcomes at the retail level, either by acquiring a retail asset through the sale process or by creating the threat of entry at the retail level through future vertical integration. This will promote competitive outcomes in both the generation sector and the retail sector, which will ultimately benefit end-consumers of electricity.

3.3 Facilitating liquid markets for firm contracts

The co-insurance arrangement is important for facilitating liquid markets for firm contracts by providing Gentraders with the opportunity to offer a larger volume of firm contracts for a given level of risk.

The NEM-wide wholesale market for the supply of electricity incorporates both the physical trading of electricity through the spot market, as well as the entry into electricity derivative contracts to hedge against (or speculate on) movements in spot prices. Effective financial markets are important for a well-functioning electricity market, particularly in promoting competition at both the wholesale level and the retail level. At the wholesale level, well-functioning competitive financial markets encourage competitive generator bidding behaviour while also providing a forward price that can signal the need for new investment and a means for generators to secure future earnings required to fund those investments. At the retail level, well-functioning financial markets provide a forward price that can act as a benchmark for pricing retail offers, and can provide a means for retailers to lock in a wholesale price for electricity upon which they can base prices for their fixed price retail contracts. The impacts on the retail market are discussed further in section 4 below.

At the wholesale level, in the absence of co-insurance, the Energy Reform Strategy (specifically, the creation of five Gentrader bundles from the three State-owned Generators) is likely to result in fewer firm contracts being available from the existing NSW generation assets. With the existing three portfolios split into five Gentrader bundles, the risk of unfunded difference payments to each Gentrader will increase. Gentraders will likely seek to manage this risk by reducing their supply of firm contracts.

The co-insurance arrangement provides Gentraders with the opportunity to offer a larger volume of firm contracts for a given level of risk. Under the Gentrader arrangements, Gentraders receive a defined level of availability from the power station, but this availability is not firm on the half-hour. However, the co-insurance arrangement provides the Gentraders with capacity that is firm (under all but the most extreme scenarios) on the half-hour, and at a level that is greater than the Gentraders could achieve simply with the availability provided by the power stations in their Gentrader bundle.

While the co-insurance arrangement does not impose any requirement on the Gentraders to contract in the wholesale market in any particular way – all of the Gentraders' dispatch decisions and contracting decisions remain their own – the co-insurance arrangement reduces the risk of unfunded difference payments arising as a result of Gentraders entering into (additional) firm contracts with retailers. Other things being equal, this could be expected to increase the supply of firm hedging instruments by Gentraders and increase the ability of retailers to acquire sufficient hedging contracts to meet their risk management policies.

These benefits due to the co-insurance arrangement – a more competitive wholesale market with greater liquidity for firm contracts – are likely to arise irrespective of the identities of the parties that become the Gentraders. Obviously, what any given Gentrader will choose to do in any particular set of circumstances cannot be predicted with certainty. Gentraders' strategic decisions will depend, among other things, on the other assets in their portfolio (including upstream and downstream assets) and what this implies about the management of risk across their portfolio. However reducing the risk of entering into an incremental firm contract should increase the willingness of a Gentrader to enter into that firm contract. This is because a reduction in the risk of entering a firm contract will alter the equilibrium trade-off between:

- the revenue-certainty of contracting a higher level of capacity; and
- the potential to benefit in the spot market from contracting a lower level of capacity,

towards a greater level of contracting, other things being equal.

For instance, even for a vertically integrated Gentrader, a reduction in the risk of entering into more hedging contracts should decrease the cost and riskiness of offering an additional contract to the market, thereby encouraging them to offer more contracts than they would in the absence of the co-insurance arrangement. As the greater level of firm contracts being offered to the market results in reduced risk for retailers, this could potentially translate to reduced wholesale prices for retailers and, where these lower prices are passed on, to end-consumers.

4. Benefits from improved outcomes at the retail level

From the perspective of retailers (and their customers), disaggregation of ownership at the generation level offers both costs and benefits. On one hand, disaggregation of ownership at the generation level results in a less concentrated wholesale market and, other things being equal, is likely to result in lower spot prices and lower contract prices. However, disaggregation of ownership at the generation level also results in increased risk of unfunded difference payments for generators and, as a result, a decreased willingness by generators to offer firm contracts.

As discussed in Section 2.1, retailers prefer firm contracts so that they are able to match their retail offers to end-customers (which are firm, and at a fixed price) with supplies that are firm and at a fixed price. In practice, because of the substantial risk associated with volatile spot prices and the low margins that retailers operate on, retailers seek to hedge a substantial proportion of their expected load with financial derivative contracts. Any significant exposure to the spot market can result in substantial losses, or bankruptcy, for a retailer in a short period of time.

If retailers are unable to secure their preferred quantity of firm contracts, they will turn to other approaches to managing their risk. For instance, they may simply increase the price that they charge end customers as compensation for the additional risk that they face. Alternatively, retailers may invest in peaking generation capacity in order to provide themselves with a natural hedge. This investment in unnecessary additional plant to manage their exposure to spot price risk ultimately increases the costs of supplying electricity to consumers. It is more efficient to make better use of existing capacity, as will be achieved through the co-insurance.

The Energy Reform Strategy is intended to improve outcomes for retailers (and their customers) by reducing wholesale market concentration without reducing the willingness of generators to offer firm contracts. In effect, this eases the buying conditions for retailers with a greater supply of firm contracts for a given level of demand. The Energy Reform Strategy reduces wholesale concentration by splitting the existing three portfolios in NSW into five Gentrader bundles. To overcome the impact that this increased disaggregation would otherwise have on the willingness of Gentraders to offer firm contracts, the co-insurance arrangement has been designed to reduce the risk of unfunded difference payments that Gentraders would otherwise face, as discussed above. In this way, retailers (and their customers) can benefit from increased wholesale market competition.

The implications for the wholesale market of splitting the existing three portfolios into five Gentrader bundles are a particular concern as the supply-demand balance of the market tightens. This is because, as this happens, wholesale electricity prices are likely to become increasingly volatile. This, in turn, increases the importance to retailers of effectively managing the wholesale market risk to which they are exposed.

Co-insurance is also important because it enables the Government to offer five Gentrader bundles while still meeting the Government's value objectives. These five bundles compare with three incumbent retailers in NSW. To the extent that retail entry is facilitated by the ownership of generation assets, the offering of five Gentrader bundles increases the future threat of entry at the retail level. This promotes a more competitive retail market than would otherwise be the case, which will ultimately benefit end-consumers of electricity.

These benefits in the retail market are likely to arise irrespective of the identity of the Gentraders. As discussed, regardless of the identity of Gentraders, an increase in the number of Gentraders and a reduction in the risk to Gentraders of offering contracts to the market, is likely to result in a more dynamic and competitive retail market.

5. Benefits to the State of NSW

The co-insurance arrangement provides benefit to the State of NSW in a number of ways. As set out above, benefits to the State of NSW are benefits "to the community generally" and, as such, are public benefits for the purpose of the authorisation test.

Indirectly, but substantially, the State of NSW benefits from the improved outcomes in the wholesale market and the retail market that the co-insurance arrangement promote. As discussed, one of the Government's key objectives is to deliver a more competitive wholesale electricity market in the NEM and a more competitive retail market. This will increase the potential for the sector to respond dynamically and innovatively to market forces and opportunities. The co-insurance arrangement is an important element in achieving this objective.

More directly, the co-insurance arrangement is expected to provide the State of NSW with the benefit of lower market risk exposure to plant outages, enhancing the value of the taxpayers assets. This will help place the State of NSW in a stronger financial position and ensure that the State's limited financial resources can be directed in a manner that best serves the public and the State.

In addition, the co-insurance arrangement is expected to attract a wider range of parties prepared to invest in NSW. Co-insurance is valuable to new entrants because:

- New entrants have few options to manage the risk of unfunded difference payments associated with the generation assets in each Gentrader bundle, at least until such time as the new entrant expands its portfolio of assets.
- New entrants will be less familiar with the NSW generation assets. Since co-insurance provides some measure of insurance against the risk that particular assets are less reliable than expected, it is likely to be attractive to new entrants.

As a result, co-insurance is expected to encourage participation by new entrants in the transaction process. Increased participation by new entrants will increase the competitiveness of the transaction process, with the result that the State of NSW will be better able to capture appropriate value through the transaction process.

Reduced penalty payments for the State of NSW are expected because the supply of co-insurance, where available, helps reduce the likelihood that availability obligations under the Gentrader contracts will be breached. As a result, for a given level of availability under the Gentrader contract, a given penalty regime under the Gentrader contract and a given distribution of outages, the co-insurance arrangement reduces the penalty payments that the State-owned Generators will be required to make. This is a direct saving to the Generators and the State of NSW, and ultimately benefits the public of NSW.

Finally, the operation of the co-insurance arrangement will ensure that there will be incentives on the Generators to improve their availability as generators calling on co-insurance will have to pay for the services of the reliable generators that meet their shortfall in firm capacity. This will also encourage the Gentraders to invest in the relatively unreliable generators. This will ultimately improve the reliability of the State's power system and will ensure that investment in the State's generators is continued. In any case, under the Gentrader contract the Generators will be given more than adequate funds to maintain their power stations at a high standard of service over the life of the contract. This will ensure that all power stations will operate as they would, if not better, for their remaining technical lives.

6. Benefits to Gentraders

6.1 Management of Gentraders' risk of unfunded difference payments

As set out above, Gentrader contracts will be written on the basis of individual power stations. This is necessary to ensure that the dispatch of each power station by the Gentrader reflects the unique technical characteristics and costs associated with each power station.

However, Gentrader contracts will be offered to bidders in five Gentrader bundles, rather than the three existing State-owned generation portfolios. As discussed in the Competition Memorandum, this decision is driven by the policy objectives of the NSW Government, including the objective of delivering a more competitive wholesale electricity market in the NEM and a more competitive retail market.

While offering a larger number of small Gentrader bundles is beneficial for the competitiveness of both the generation sector and the retail sector, it will have implications for the risk of unfunded difference payments due to plant outages faced by Gentraders.

The co-insurance arrangement overcomes the increase in the risk of unfunded difference payments associated with offering the Gentrader contracts as five Gentrader bundles rather than the existing three portfolios. The co-insurance arrangement achieves this by providing for the management of the risk of unfunded difference payments across *all* of the power stations within the co-insurance arrangement. In this way, the co-insurance arrangement provides the Gentraders with a given level of capacity at a lower level of risk of unfunded difference payments.

Figure 1 through Figure 4 provide worked examples of the risk of unfunded difference payments associated with defined levels of capacity, with and without co-insurance. These examples assume either a generic four-unit Gentrader bundle (which is consistent with the Bayswater Gentrader bundle, the Liddell Gentrader bundle, the Eraring Gentrader bundle and the Delta West Gentrader bundle) or a generic two-unit Gentrader bundle (which is consistent with the Delta Coastal Gentrader bundle, given the exclusion of Munmorah and Colongra from the co-insurance arrangement). These examples also

assume generic expected outage rates of either 10 per cent or 20 per cent[23]. Finally, these examples assume that the firm capacity available under the co-insurance is allocated to Gentraders in proportion to the total contract capacity of the power station over which they have trading rights.

Each of Figure 1 through Figure 4 show that co-insurance reduces the risk of unfunded difference payments associated with the firm level of capacity, relative to the absence of co-insurance. The impact of co-insurance in reducing the risk of unfunded difference payments is greatest for two unit Gentrader bundles, and, for a given level of firm capacity, is greater for higher outage rates.

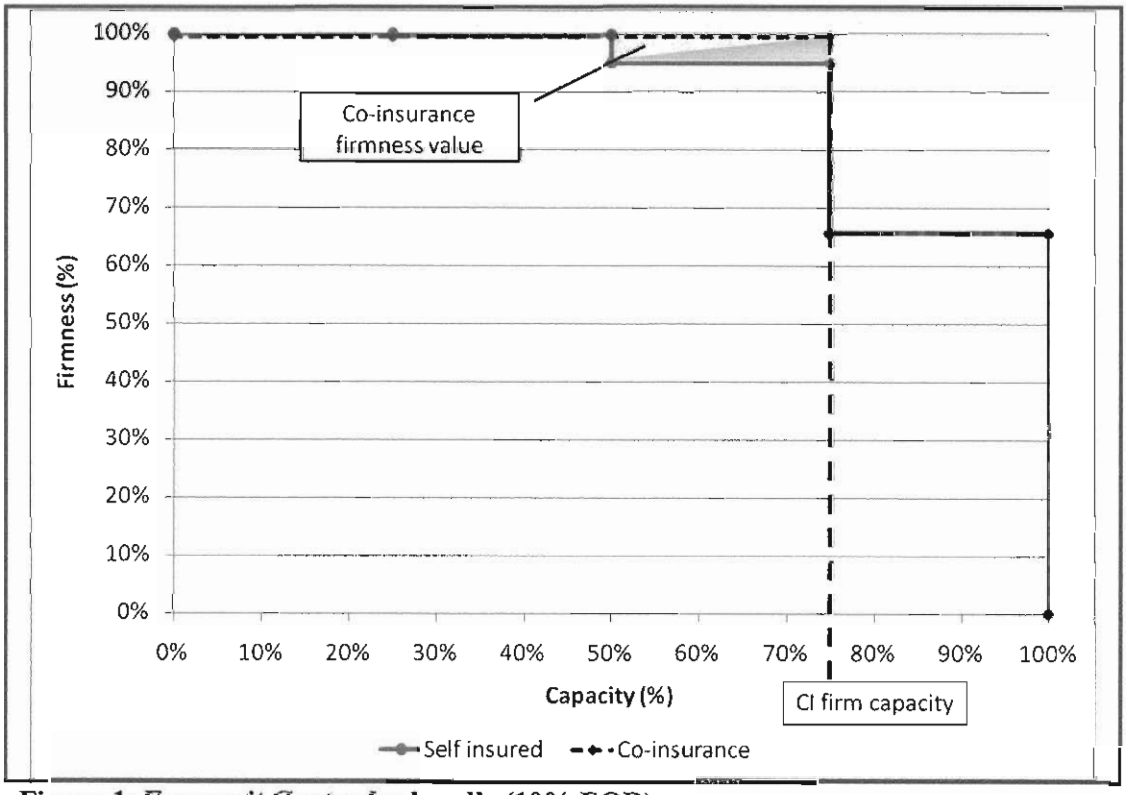

Figure 1: Four unit Gentrader bundle (10% EOR)

[23] These assumed expected outage rate values lie within the range of the current data provided by Worley Parsons.

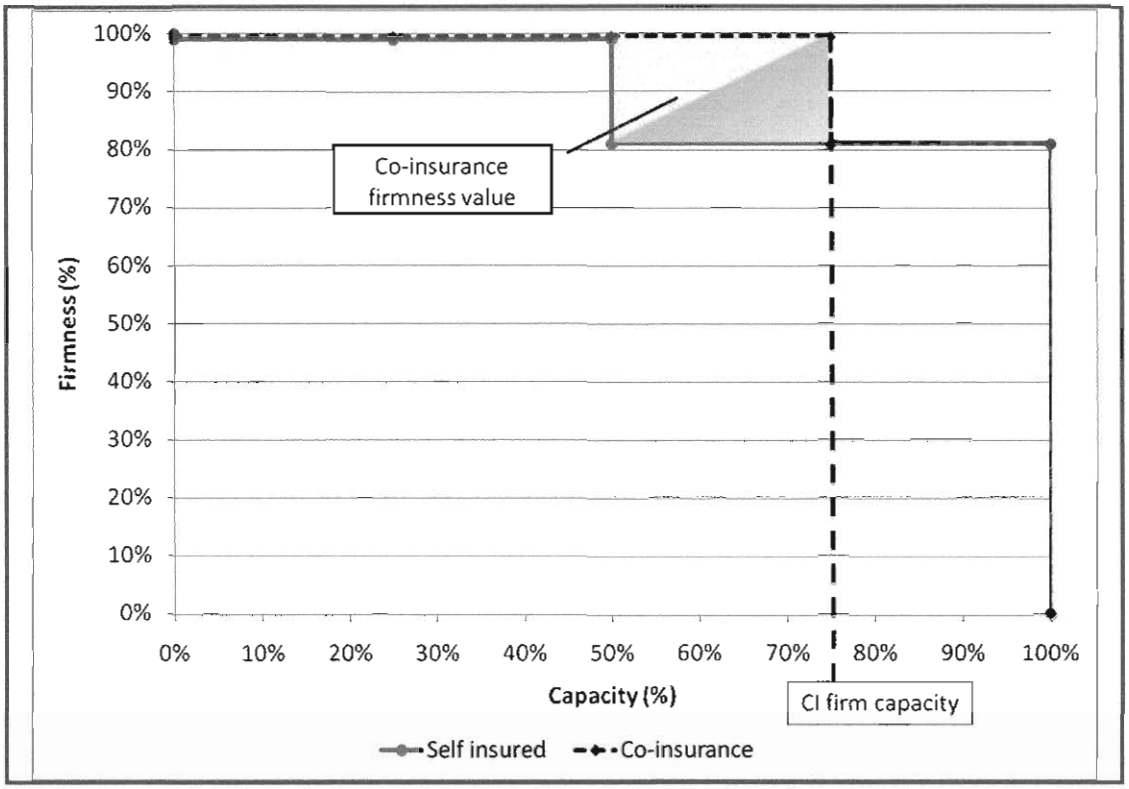

Figure 2: Two unit Gentrader bundle (10% EOR)

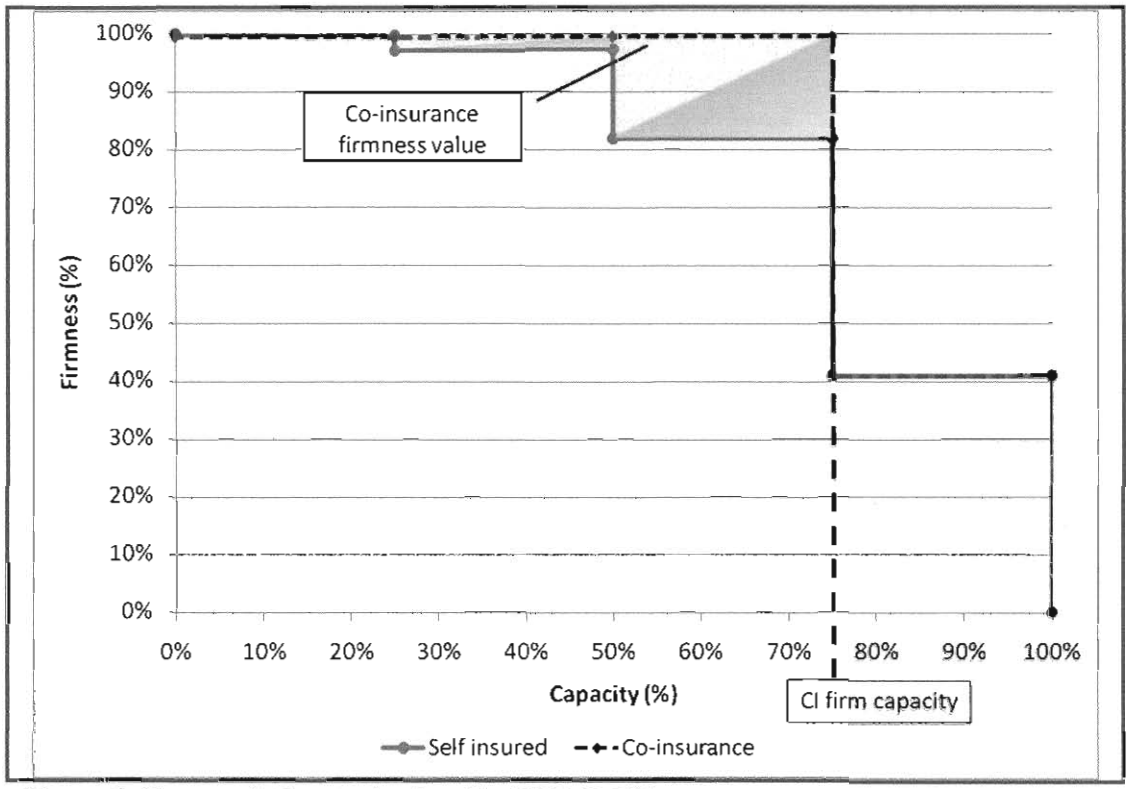

Figure 3: Four unit Gentrader bundle (20% EOR)

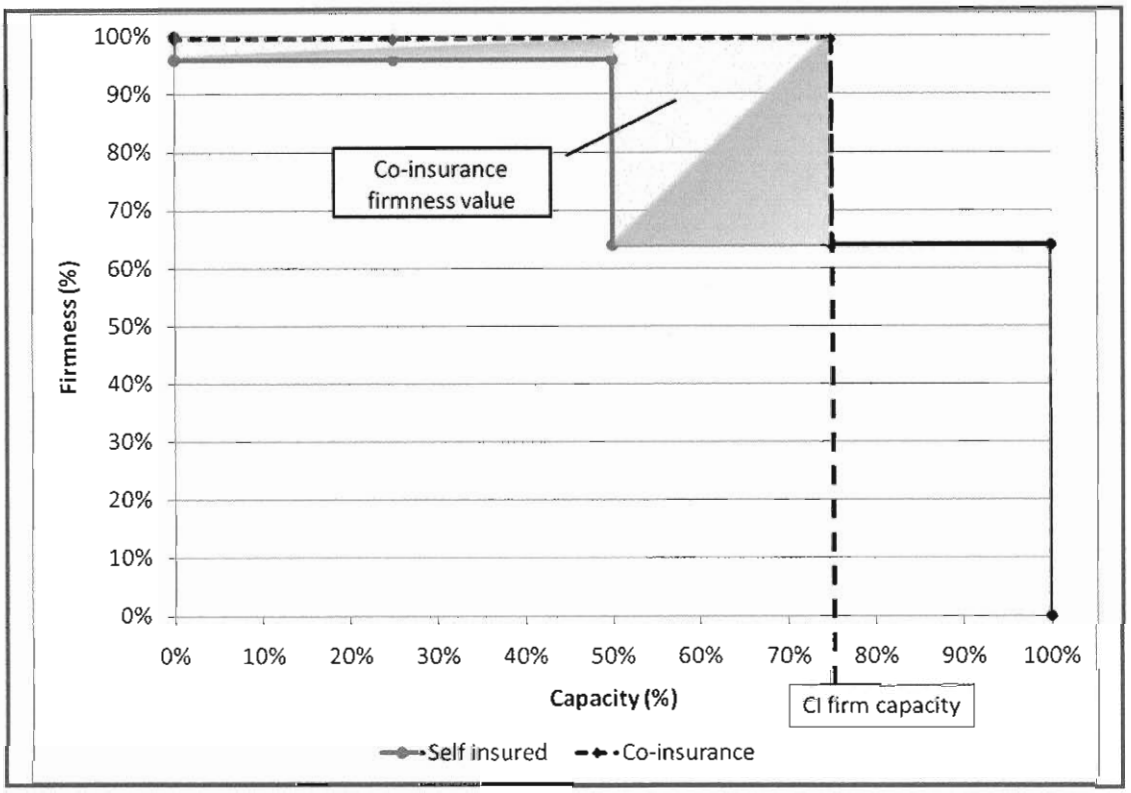

Figure 4: Two unit Gentrader bundle (20% EOR)

Figure 1 through to Figure 4 provide an estimate of the extent to which co-insurance increases the firmness associated with the firm capacity level. While not shown in Figure 1 through to Figure 4, co-insurance also decreases the extent to which Gentraders would expect to be able to call on their non-firm capacity. The difference between the value of firm capacity relative to non-firm capacity provides an indication of the value of co-insurance to Gentraders.

Aside from the effect on the value of generators from a co-insurance arrangement the reduced risk from signing a larger quantity of the financially more valuable firm contracts has the effect of easing the ability of retailers to acquire firm contracts which, as discussed above, retailers value.

6.2 Gentraders' alternatives to co-insurance

Given that the value of generation assets can be increased by combining a number of power stations within a single portfolio, it might be expected that this value would be uncovered by potential bidders for Gentrader contracts. However, there are restrictions on the ability of bidders to achieve this.

First, there are limited opportunities to combine the existing Gentrader bundles with other significant assets in the short to medium term, particularly in the NSW region. This is true for both existing generation assets and new generation assets:

- While there is independent generation in NSW, it is currently relatively limited. The obvious cases are TRUenergy's Tallawarra power station and Origin Energy's Uranquinty power station. These power stations would provide an opportunity for TRUenergy and Origin Energy to integrate one of the Gentrader bundles into a larger portfolio in NSW, and to provide a measure of self-insurance against the risk of unfunded difference payments. However, other bidders, particularly new entrants, will be unable to do the same.

- One of the key objectives of the Energy Reform Strategy is to provide incentives and opportunities for private sector investment in new generation capacity in NSW. Gentraders will be among those with the opportunity to invest in new generation capacity in NSW. To the

extent that Gentraders do invest in new generation capacity, they will have the opportunity to integrate the Gentrader bundles into a larger portfolio, and to provide a measure of self-insurance against the risk of unfunded difference payments. However, significant new investment in generation capacity in NSW is unlikely to occur for a number of years. While the Energy Reform Strategy involves the sale of development sites to the private sector, each of which will be progressed through the planning approval process at least to some extent, it will nevertheless be a number of years before a new power station can be constructed and commissioned at one of these sites. As a result, the development of new generation capacity in NSW is unlikely to provide an opportunity for Gentraders without existing generation assets in NSW to self-insure against the risk of unfunded difference payments for a number of years.

While there may be opportunities to combine the Gentrader bundles with other assets in the broader NEM-wide market, implementing a co-insurance arrangement across regional boundaries will be less effective at managing the risk that counterparties face. While price separation across regional boundaries is, for the most part, confined to instances with low price differences, there are episodes of significant price separation between regions. Risk management during these episodes is likely to be particularly important to counterparties, suggesting that a co-insurance arrangement occurs most naturally within a single region.

Second, Gentraders are likely to find it difficult to negotiate equivalent co-insurance arrangements following completion of the transaction. Certainly, there are likely to be opportunities for Gentraders to negotiate to enter into some other form of insurance or co-insurance arrangement once the transaction is completed. Indeed, there are examples of the risk of unfunded difference payments being managed by the market through the implementation of explicit co-insurance arrangements between generators. However, negotiating and implementing a bi-lateral or multi-lateral co-insurance arrangement will be difficult for successful bidders. While there are gains to the implementation of a co-insurance arrangement, negotiation over the preferred manner of achieving these gains, and allocating these gains between participants, will be complex. Among other things, the outcome of negotiations between Gentraders in regard to co-insurance arrangements will depend on the relative bargaining position of the Gentraders. In particular, new entrants are likely to be in a weaker bargaining position than participants with existing generation assets, because new entrants will have fewer options for managing the risk of unfunded difference payments (at least in the short term).

Finally, if the Government relies on Gentraders privately negotiating a co-insurance arrangement following completion of the transaction, the State of NSW is unlikely to receive any of the benefits of co-insurance that are outlined in this submission.

7. Duration of co-insurance

The term of the Compensation Deed and, as such, the co-insurance arrangement, is 10 years. A term of 10 years is important in supporting the overall Energy Reform Strategy for a number of reasons.

First, a term of at least 10 years for the co-insurance is considered appropriate in relation to the term of the Gentrader contracts. The term of the Gentrader contracts is for the technical life of the relevant power stations. For the majority of Gentrader contracts, this implies a contract term of between 20 and 30 years.[24] For the term of the Gentrader contracts, the State of NSW, through the Generators, is exposed to the risk of making penalty payments in the event that the Generator's availability obligations under the Gentrader contracts are breached. The co-insurance arrangement helps mitigate this risk for the first 10 years of the Gentrader contracts by reducing the likelihood that those availability obligations will be breached.

[24] See further, Competition Memorandum, Table 1, page 13. Except for Liddell with an expected life of 2025, all other power stations the subject of the co-insurance have an expected technical life of between 2030 and 2040.

For bidders for the Gentrader contracts, their investments in the Gentrader contracts will be long-term investments. By increasing the value of the Gentrader contracts, the co-insurance arrangement supports this investment.

Second, a contract term any shorter than 10 years will mean that it will be difficult for new entrants to significantly benefit from the co-insurance arrangement. In particular, new entrant bidders for the Gentrader bundles will likely be concerned if the risk management provided by the co-insurance arrangement covers only a minority of the term of the Gentrader contract, and will likely be concerned with their ability to make comparable arrangements to manage the risk of unfunded difference payments if the co-insurance arrangement falls away early in the term of the Gentrader contracts. Ultimately, this will undermine the Government's attempts to encourage new entrant bidders for Gentrader bundles.

Third, the operation of the co-insurance arrangement means that acquirers of the Gentrader bundles will not lose the risk-management benefits provided by the co-insurance arrangement if they decide to sell part of the Gentrader bundles (i.e. by selling one of the Gentrader contracts they acquired as part of the Gentrader bundle). The co-insurance arrangement allows a stand-alone Gentrader to contract, more or less, the same way as if it were part of a larger portfolio of plants. If the co-insurance arrangement does not run its full length this may dissuade further new entrants entering the market by acquiring part of a Gentrader bundle as ti would be difficult for them to compete with existing portfolio generators.

Fourth, the duration of the Compensation Deed is consistent with the NSW Government's objective of promoting efficient investment in new generation in NSW while at the same time ensuring that there is continuing supply of reliable and efficient electricity to consumers. Specifically, in order for the co-insurance arrangement to overcome the increased risk of unfunded difference payments associated with a larger number of smaller Gentrader bundles, and to promote improved outcomes in the generation market and the retail market, it is important that the term of the Compensation Deed provides sufficient time for Gentraders to pursue other opportunities to manage the risk of unfunded difference payments. The obvious alternative to the co-insurance arrangement is for Gentraders, particularly new entrant Gentraders, to expand their generation portfolios, particularly in NSW (in order to manage the risk associated with differences in regional prices). Given the lead time required for investment in new generation capacity, the NSW Government considers that a contract term of 10 years is necessary.

The NSW Government considers that a shorter contract term would create the risk of significant problems for the wholesale market, in particular. For instance, if the Compensation Deed term was 5 years, the Deed would expire at about the same time that the NSW region is forecast to reach supply-demand balance. A reduction in the ability of Gentraders to manage the risk of unfunded difference payments at the same time as the NSW generation sector reaches supply-demand balance could be very detrimental to the retail market, with the potential that there will be insufficient firm contracts available to meet retailers' risk management policies. As discussed above, the issues arising from the NSW generation sector reaching supply-demand balance are heightened by disaggregation of the Generators into the five Gentrader bundles. This again reinforces the importance to the Energy Reform Strategy of the proposed co-insurance arrangement.

Finally, given the term of the Gentrader contracts, in order for the co-insurance arrangement to be of sufficient value to Gentraders to attract more bidders and higher bids, the NSW Government considers that a contract term of 10 years is necessary. A shorter contract term is relatively insignificant in the context of the term of the Gentrader contracts, and creates the risk that the co-insurance arrangement is seen be bidders as being too short to add significant value to the Gentrader contracts. In order for the Energy Reform Strategy to be implemented, it is necessary that the Government's value objectives be met.

Although most authorisations granted by the Commission are not for more than 5 years, terms of 10 years or longer are not uncommon in appropriate circumstances. For instance, the Commission has recently granted authorisations in relation to the joint tender and contracting for waste management services by local councils for up to 20 years.[25] As is the case with co-insurance, the length of these authorisations were designed to attract and protect significant new long-term investments and create certainty.

8. Negligible anti-competitive detriments

For the reasons set out above in this Part C, the NSW Government considers that co-insurance will promote not hinder competition in wholesale and retail electricity markets. As a key element of the Energy Reform Strategy, co-insurance facilitates the improved competitive outcomes that will result from the implementation of that Strategy. The co-insurance arrangement will mean that a larger number of Gentrader bundles can be offered to the market and Gentraders will have incentives to enter into more contracts than they would in the absence of the arrangement. This is likely to lead to increased levels of contract liquidity, and more competitive outcomes than would otherwise be the case.

This section addresses potential arguments that could possibly be raised as to how the co-insurance may have an adverse impact on competition. However, for the reasons set out below, the NSW Government considers that any such detriments are likely to be minimal at most and would easily be outweighed by the public benefits discussed above.

Ultimately, the benefits provided by co-insurance discussed above are all derived from the fact that co-insurance assists Generators in managing the risk of unfunded difference payments. However, in order to benefit from the level of firm capacity provided by co-insurance, Gentraders are required to forego pool revenues from their non-firm capacity when called upon to supply co-insurance. This impact could be seen as a potential detriment to competition resulting from co-insurance: because Gentraders may be required to use this non-firm capacity to support co-insurance payments, the Gentraders may be reluctant to otherwise contract this capacity in the market. However the NSW Government considers that any detriment arising from this will be more than outweighed by the additional firm contracts that could be offered to the market as a result of the co-insurance arrangement (in addition to the other public benefits of co-insurance).

It is also worth noting that the more intense competition under the co-insurance arrangement will not necessarily be associated with the most unconcentrated wholesale market *structure* over the long term. It could be argued that because the absence of the co-insurance arrangement is likely to result in a reduction in the supply of contracts to the market, more generation investment would occur without the co-insurance arrangement than if the arrangement was implemented. For example, as noted above in section 4, in the absence of the co-insurance arrangement, retailers may choose to invest in peaking plant themselves in order to reduce their dependence on wholesale hedging contracts offered by the Gentraders.

However, the objective of Part IV of the TPA is to protect and promote competition, and not an unconcentrated market structure per se. A competitive market is one in which prices broadly reflect costs – which is more likely under the co-insurance arrangement than in its absence – *rather than one in which* high prices lead to more investment and (only potentially) an increase in the number of suppliers. The co-insurance arrangement, by encouraging a higher level of contracting, will not only promote competitive behaviour by participants and competitive market outcomes, but will help avoid inefficient premature generation investment caused by a shortage of firm contracts. The efficiency costs of investment occurring earlier than is socially optimal will ultimately be borne by consumers through higher average retail prices for electricity in the long term. A better outcome is to make more

[25] ACCC Determination, Application for Authorisation lodged by Hurstville City Council & Ors, 6 November 2009; ACCC Determination, Application for Authorisation lodged by Ashfield City Council & Ors, 22 October 2009

efficient use of existing capacity so that such unnecessary costs are avoided. At the same time, co-insurance does not delay efficient investment because co-insurance does not create any barrier to efficient investment in new generation plant.

Another form of detriment from the co-insurance arrangement that may be alleged is that it would provide incumbent Gentraders with an advantage that would not be available to new entrants. In particular, the co-insurance arrangement would facilitate Gentraders entering into financial contracts in relation to a larger proportion of their capacity than new entrants, who would not have access to the co-insurance arrangement. This would, in turn, tend to discourage new entrant investment in generation. It is true that the co-insurance arrangement, by design, incorporates only the key existing baseload generators in NSW. New entrant generation capacity will not have access to co-insurance arrangement unless the Gentraders agree to re-negotiate the arrangements. However, lack of access to the co-insurance arrangement does not only apply to generation investment by new entrants – it would also apply to new investment by the Gentraders themselves. In this sense, the co-insurance arrangement does not discriminate between different potential investors in new generation capacity (e.g. Gentraders versus new entrants).

Further, the underlying pre-condition for new investment in generation, namely the supply-demand balance, will remain unchanged. Although co-insurance will ensure that more efficient use is made of existing generation assets, it will not impact on the supply-demand balance and the need for investment in baseload generation as that balance tightens.

Finally, it should be noted that the co-insurance arrangement has been structured so as to ensure that any potential anti-competitive detriments are minimised. Relevantly, the Gentraders will not be sharing any commercially sensitive information. This mitigates the risk that Gentraders will have an increased ability to engage in collusive conduct as a result of the co-insurance arrangement. First, the co-insurance arrangement have been designed so that the arrangements do not require any communication of cost information between participants, in order to avoid any potential for the co-insurance arrangement to facilitate coordinated behaviour. Second, the co-insurance arrangement have been designed so that the arrangements do not impose an obligation on participants to bid in a particular manner, again in order to avoid any potential for the co-insurance arrangement to facilitate coordinated behaviour. Finally, under the co-insurance arrangement, all information that is required to operate the arrangement will flow through the co-insurance Administrator.

In addition, the co-insurance has also been designed so that incentives are correctly aligned and not distorted. The structuring of payments and the allocation rules mean that Generators and Gentraders will have incentives to take actions that will minimise the likelihood of outages. This is discussed further in Appendix 1.

Appendix 1
Further details of the co-insurance arrangement

1. Payments under the co-insurance arrangement

This section sets out a stylised example of the payments between Gentraders and Generators that will occur under the co-insurance arrangement. The examples set out in this section are presented for the simple case where there are only two Gentraders and two Generators operating equally sized generating units. These examples are sufficient to highlight the principles by which firm availability will be provided and payments for firm availability will be made. Section [?] will discuss additional features of the arrangement that are necessary when more than two Generators are involved.

The co-insurance arrangement can be structured in a number of different ways, each of which achieves the objective of increasing the quantity of firm capacity available to the Gentraders. Many of the alternate formulations of co-insurance are suboptimal because they require signalling of cost information among the parties to the co-insurance arrangement, or because they create misaligned incentives between Gentraders and Generators.

The form of the co-insurance arrangement, and associated payments, presented in this section overcomes these issues. It will be shown that by ensuring that the Gentraders and their Generators always make payments of the same magnitude, but in opposite directions, incentives are correctly aligned. Also, by structuring the payments analogously to a swaption with a strike price set higher than the marginal costs of all the participants, issues regarding the revelation of sensitive cost information are avoided.

1.1 General features of the arrangement

Regardless of the specific form of the co-insurance arrangement, the following features are common in all cases:

- Gentraders:
    - deal only with the Generator that is counterparty to their Gentrader contract, and with the Administrator;
    - make/receive co-insurance payments to/from the Generator that is counterparty to their Gentrader contract;
    - retain the right to bid the Generator's capacity into the market (within the operating envelope and the limits of the Gentrader contract);
    - depending on their dispatch decisions, are able to receive pool operating profits equivalent to at least the firm capacity under co-insurance arrangement; and
    - under the Gentrader contract, make the required variable payments and fixed payments to their Generator.[26]
- Generators:
    - deal only with the Gentrader that is counterparty to their Gentrader contract, and with the Administrator;
    - make/receive co-insurance payments to/from the Gentrader that is counterparty to their Gentrader contract;

[26] Note that the payment structure under the Gentrader contract will be more refined than a simple fixed payments and variable payment. But the principle behind the payment structure will be that fixed costs are recovered through fixed payments and variables costs are recovered through variable payments. For this reason, assuming that payments under the Gentrader contract reduce to a single fixed payment and a single variable payment is sufficient for the examples in this report.

- under the Gentrader contract, make their capacity available to be dispatched in to the market by the Gentrader (within the operating envelope and the limits of the Gentrader contract); and,
- under the Gentrader contract, recover variable costs and fixed costs from their associated Gentrader in the form of a variable payments and a fixed payments.

1.2 Assumptions

The example of the co-insurance arrangement presented in this section assumes that there are:

- Two Gentraders:
  - *Gentrader 1* and *Gentrader 2*; and
- Two Generators:
  - *Generator 1* and *Generator 2,* each with two equally sized generating units.

Notation includes the following:

- the pool price is P;
- there is a pre-determined co-insurance price P_{CI} which is greater than all the participating Generators marginal costs (including carbon);
- the fixed payments under the Gentrader contract are CC_i;
- the variable payments under the Gentrader contract and fuel contracts are MC_i;
- *Gentrader 1*:
  - under the Gentrader contract has total contract capacity C_1 for *Generator 1*;
  - under the Gentrader contract has available capacity AC_1; and,
  - under the Gentrader contract dispatches *Generator 1* for Q_1;
  - under the Compensation Deed has firm capacity F_1.

The examples throughout this section occur for a single hour. This simplifies calculations as 1 MW of capacity, operating for 1 hour, produces 1 MWh of electricity.

1.3 Payments under co-insurance

Initially, the cashflows under the co-insurance arrangement for the general (algebraic) case for different numbers of outages is considered. This will be considered in Section 1.4 to Section 1.6. This will be followed by a corresponding set of numerical examples, for a given level of demand and pool price. This will be considered in Section 1.8 to Section 1.10.

Co-insurance payments occur in order to firm up capacity for Gentraders. This is achieved by a responding Gentrader foregoing a portion of their non-firm pool operating profit to the calling Gentrader. The responding Gentrader foregoes a proportion of their non-firm pool operating profit as the cost of a higher level of certainty on the firmness of its own capacity when it experiences an outage at a later date.

1.4 Cash flows when no Generator experiences an outage

When no outages occur, the co-insurance arrangement is not invoked and Gentraders earn pool revenues according to their dispatch decisions and compensate Generators for the fixed and variable

costs of production as required under the Gentrader contract. This results in the following cash flows for both Gentraders:

- receive $P*Q_i$ from the pool;
- pay MC_i*Q_i to *Generator i* (or *fuel supplier f* once the existing fuel contracts expire and the Gentraders secure their own fuel) to cover the variable costs of generation;
- pay CC_i*Q_i to *Generator i* to cover the Generators' fixed costs.

Where Generator i refers to either Generator 1 or Generator 2.

Figure 5 shows a diagrammatic representation of the associated cash flows. Generators break even on variable costs and receive the fixed payment, and Gentraders earn pool revenues less the variable payment and the fixed payment.

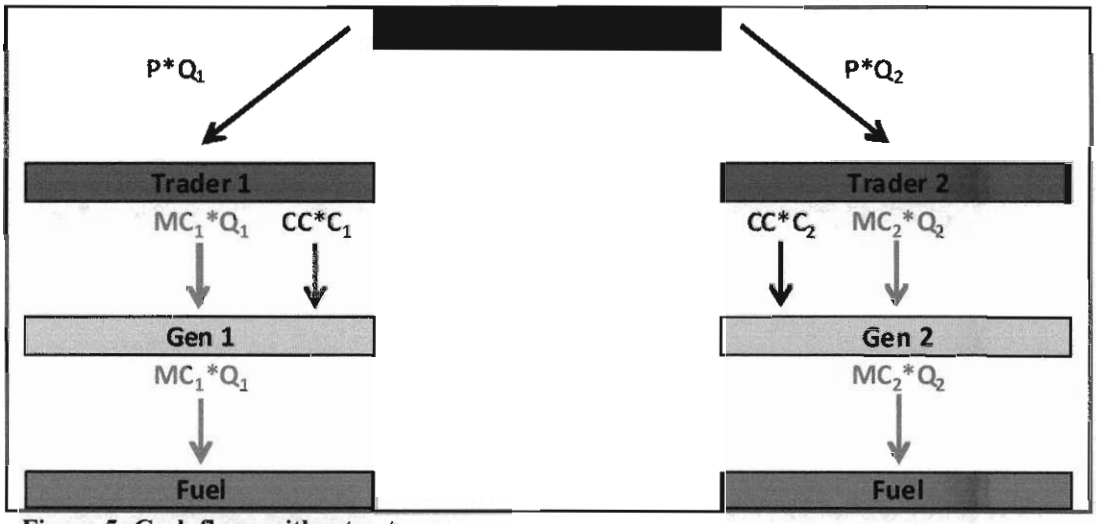

Figure 5: Cash flows without outages

1.5 Cash flows when one Generator experiences an outage

Now assume that *Generator 1* experiences an outage of one of their two generating units such that their available capacity, AC_1, is less than *Gentrader 1's* firm capacity levels under the co-insurance arrangement, F_1.

Under the co-insurance arrangement, when *Generator 1* declares its available capacity to be less than the firm capacity, *Gentrader 1* can choose to call on co-insurance for up to the difference between firm capacity and available capacity ($F_1 - AC_1$, where $AC_1 < F_1$). *Gentrader 1* will then receive compensation payments for the difference between available capacity and the firm capacity under the co-insurance arrangement. These payments, arising from *Generator 1's* outage, are effectively or notionally met by the other Gentraders who are party to the co-insurance arrangement, in this case *Gentrader 2*. This is achieved by *Gentrader 2* foregoing pool revenue on the dispatch of its non-firm capacity.

In this example *Gentrader 1* is assumed to call on the maximum amount of co-insurance possible, which is firm capacity less available capacity. The co-insurance arrangement works by notionally requiring *Gentrader 2* to pay *Gentrader 1* pool price less the co-insurance price on this quantity. This amount is given algebraically as:

$$(F_1 - AC_1).(P - P_{C1})$$

At the same time as payments are notionally required between Gentraders, payments are notionally required between Generators. *Generator 1*, as the party requiring co-insurance, notionally pays *Generator 2* for supplying co-insurance. This payment is the same magnitude as the payment between the Gentraders but in the opposite direction. This is a pure transfer between the Generators and ensures that Generators are incentivised to avoid requiring co-insurance (which they have to pay for) and to supply co-insurance (which they are paid to supply).

These payments are shown diagrammatically in Figure 6.

The payments between Generators are required to ensure that the co-insurance arrangement provides appropriate incentives. By structuring the payments in this way, incentives are such that Generators will endeavour to make their plant as reliable as possible. Being more available will result in a low level of outgoing payments during outage events and also increase the likelihood that their plant will supply co-insurance and receive payments.

By setting the Gentrader payments equal and opposite to the Generator payments the co-insurance arrangement also ensures that no pairing of Gentraders and Generators has an incentive to claim false outages and thereby claim co-insurance payments. In effect, the payment structure ensures that each pairing of Gentraders and Generators is neutral to a co-insurance event. Even though Gentraders could conceivably overwhelm the incentive that Generators have to be available (and avoid making co-insurance payments) by offering a financial payment to the Generator, this would always need to be greater than the payment the Gentrader receives under co-insurance, thereby leaving the Gentrader out of pocket.

There is one exception to this and that is when two or more Generators are owned and operated by a single entity. In this case incentives are not completely aligned between the Gentraders and the Generator. This is discussed in more detail in Section 2.5, after the allocation rules have been explained.

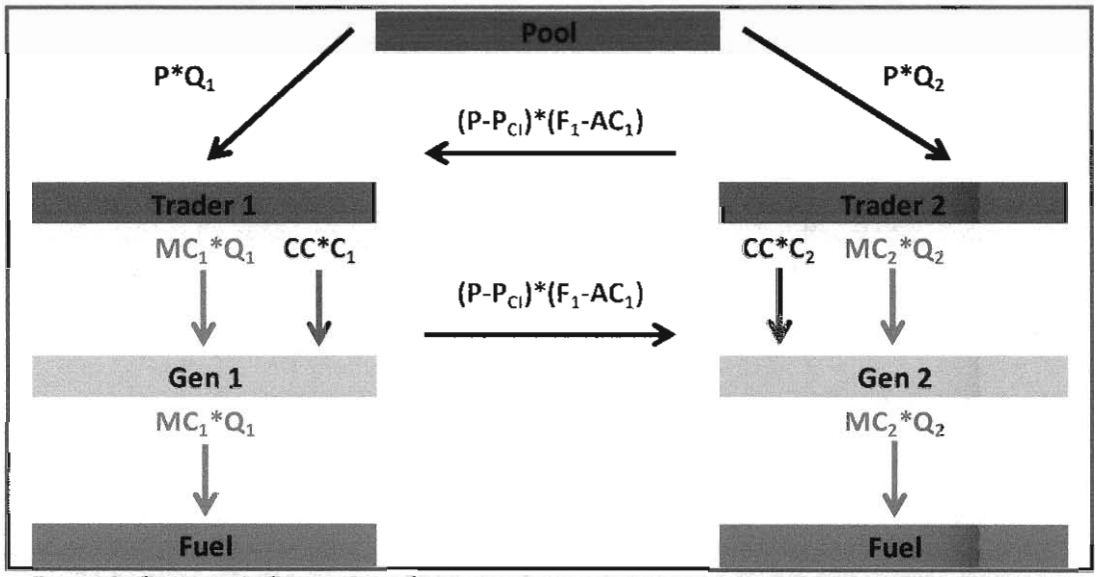

Figure 6: Gross cash flows when *Generator 1* experiences an outage and *Gentrader 1* calls on $(F_1 - AC_1)$ MWhs of co-insurance

The notional payment structure shown in Figure 6 involves a payment between the Gentraders and a payment between Generators. The incentives created by this structure of ***notional*** payments can be achieved by a simpler structure of ***actual*** payments. In particular, it is desirable to have each Gentrader dealing only with its own Generator. This allows payments and credit support arrangements for the co-

insurance arrangement to be rolled into the Gentrader contract and removes the need for bidders to evaluate the credit risk of unknown counter-parties when bidding.

For this reason, actual co-insurance payments flow solely between Gentraders and their counterparty Generators. Figure 7 shows the case where the Gentrader to Gentrader payment is effected via the Generators. Note that in this case the payments between the Generators (brown) are exactly cancelled out by the payments between the Gentraders (red). Figure 8 shows the net effect of cancelling these payments out. Hence the only actual payments required are those shown in Figure 8. Note that this structure also holds in the case of three or more Gentrader/Generator pairs.

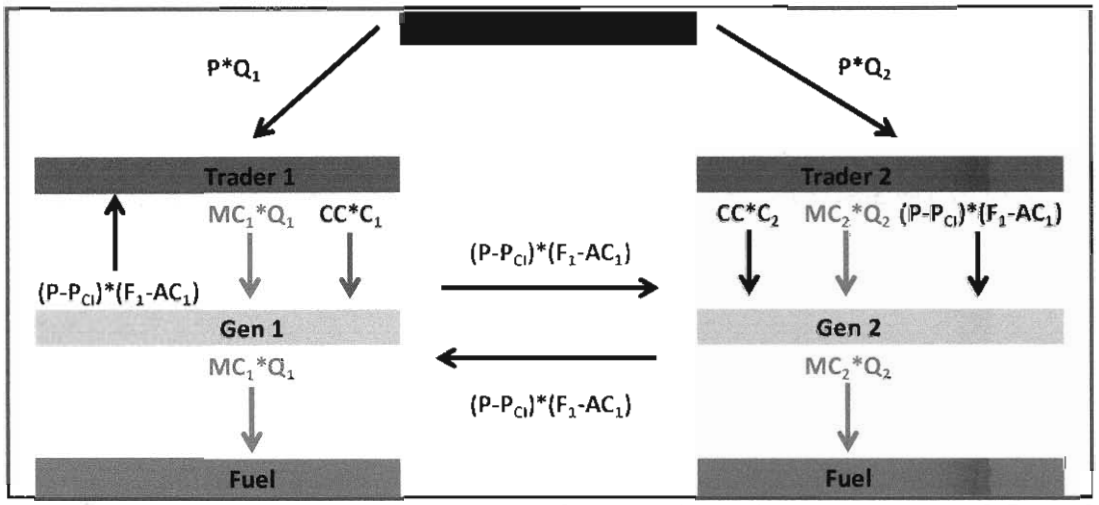

Figure 7: Gross (or notional) cash flows when *Generator 1* experiences an outage and *Gentrader 1* calls on *(F_1 - AC_1)* MWhs of co-insurance (payment via Generators)

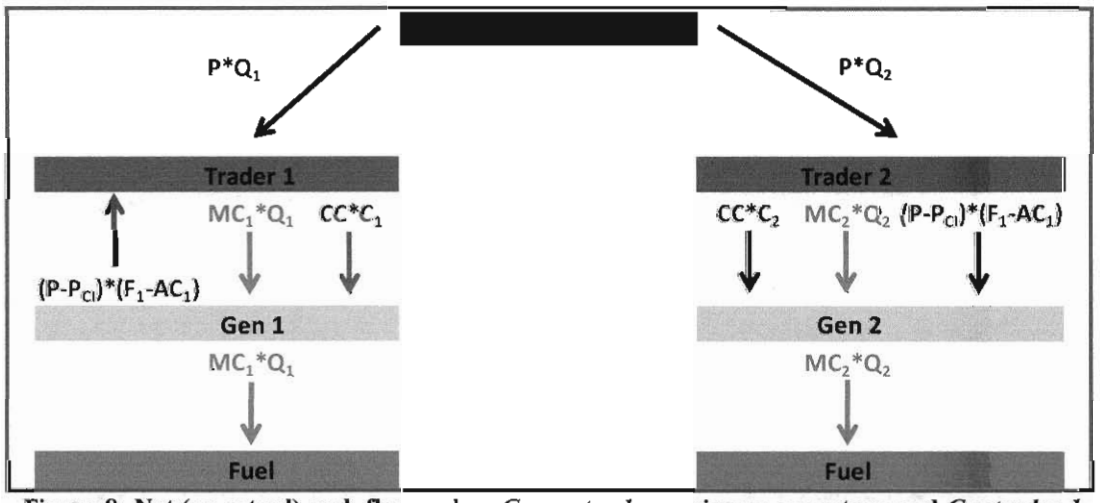

Figure 8: Net (or actual) cash flows when *Generator 1* experiences an outage and *Gentrader 1* calls on *(F_1 - AC_1)* MWhs of co-insurance (Generator payments cancel)

In its implemented form, the co-insurance arrangement involves payments only between Gentrader/Generator pairs. This means that these payments are just another settlement amount under the Gentrader contract and can be rolled into the credit support offered under the Gentrader contract.

1.6 Cash flows when two Generators experiences an outage

Now assume that both Generators experience an outage. Then, in this stylized example with only two Generators, both Generators' available capacity is less than their firm capacity, each has demand for co-insurance and neither Generator can supply co-insurance.

In this case the Gentraders wear the risk of unfunded difference payments. Put another way, the co-insurance arrangement is only pseudo-firm: firm in the event that there is suffient supply of co-insurance and non-firm in the event of a shortfall of supply of co-insurance. The co-insurance firm capacity will be set such that there is a very low probability of a shortfall of co-insurance supply.

While Gentraders may prefer the arrangement to be firm at all times, so that they are not exposed to the risk of unfunded difference payments, there are reasons that this may not be to the long-term benefit of Gentraders. To see why, it is useful to think about how generators would normally manage their exposure to spot prices. In the absence of any Gentrader contract, generators would normally:

- reduce their firm contract cover; and/or
- alter their bidding strategy to reduce pool exposure; and/or
- build a new generator to operate to meet the firm capacity shortfall; and/or
- buy hedges against the possibility of being exposed to high pool prices.

None of these market based responses will be available to the Generators under the Gentrader arrangements because:

- the Government will set the firm capacity levels required under the co-insurance arrangement;
- the Generators will not have bidding control over any generating plant; and
- the State-owned Generators will not be able to build new plant.

In other words, if the co-insurance arrangement was completely firm, the Government is likely to have an incentive to manage the associated risk by operating generation capacity outside the Gentrader contracts. In effect, making the co-insurance arrangement pseudo-firm, as described above, should provide confidence to potential bidders that the incentive for future Governments to invest in new plant, or re-assume some dispatch control over generation plant, is reduced.

1.7 Assumptions for numeric examples

The general (algebraic) case for different numbers of outages that are set out in Section 1.4 to Section 1.6 are now set out using numeric examples.

For the purposes of these numeric examples, we will assume that the two Generators and two Gentraders have capacities, firm capacities and costs as presented in Table 1.

Generator	No units	Unit size	Firm capacity	Variable cost/payment	Fixed cost/payment
Generator 1	2	50 MW	75 MW	$10 /MWh	$5/MW/h
Generator 2	2	50 MW	75 MW	$10 /MWh	$5/MW/h

Table 1: Generator assumptions for numeric example

Assume also that the pool price, co-insurance price and demand are given as in Table 2.

Pool price	40 ($/MWh)
Co-insurance price	15 ($/MWh)
Demand	200 (MW)

Table 2: Market and arrangement assumptions

Note that the co-insurance price is greater than the marginal cost of both Generators. This ensures that co-insurance will only be called when the responding Gentrader is able to cover co-insurance payments by selling energy into the pool above its costs.

1.8 Cash flows and output without outages

We will assume that each plant is fully dispatched at 100 MW (with a corresponding pool price of $40/MWh). Cash flows are summarised in Figure 9.

Each of the Gentraders receives $4,000 and makes variable payments of $1,000 and fixed payments of $500, resulting in a net position for each Gentrader of $2,500.

Each of the Generators receives $500 of fixed payments (and simply passes through variable payments of $1,000) resulting in an overall position for the Generators of $1,000.

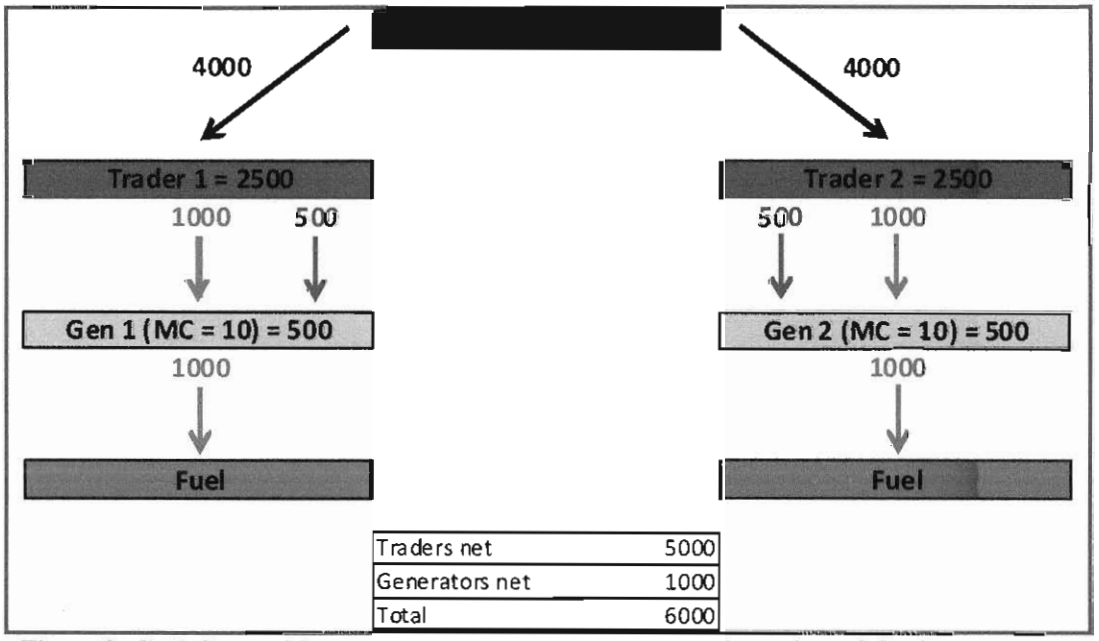

Figure 9: Cash flows without outages (net cash positions are shown in each box)

1.9 Cashflows and output when one Generator experiences an outage

Consider the case where *Generator 1* experiences an outage of one unit, reducing its available capacity to 50 MW. For simplicity, we will assume that this outage has no effect of the pool price. Output for *Generator 1* will be 50 MW and output for *Generator 2* will be 100 MW. Residual demand will be met by some other supply source at $40/MWh.

Figure 10 summarises the cashflows with the co-insurance arrangement for this case. It can be seen that both Gentraders are worse off with the co-insurance arrangement compared to when no outage occurs. However, *Gentrader 1* is better off than it would be in the absence of the co-insurance arrangement (in which case *Gentrader 1* would have a net position of $1,000). This additional income can be used to fund difference payments up to the firm quantity. For *Gentrader 2*, although revenues have reduced, its capacity also remains firm up to the firm quantity and *Gentrader 2* can contract accordingly.

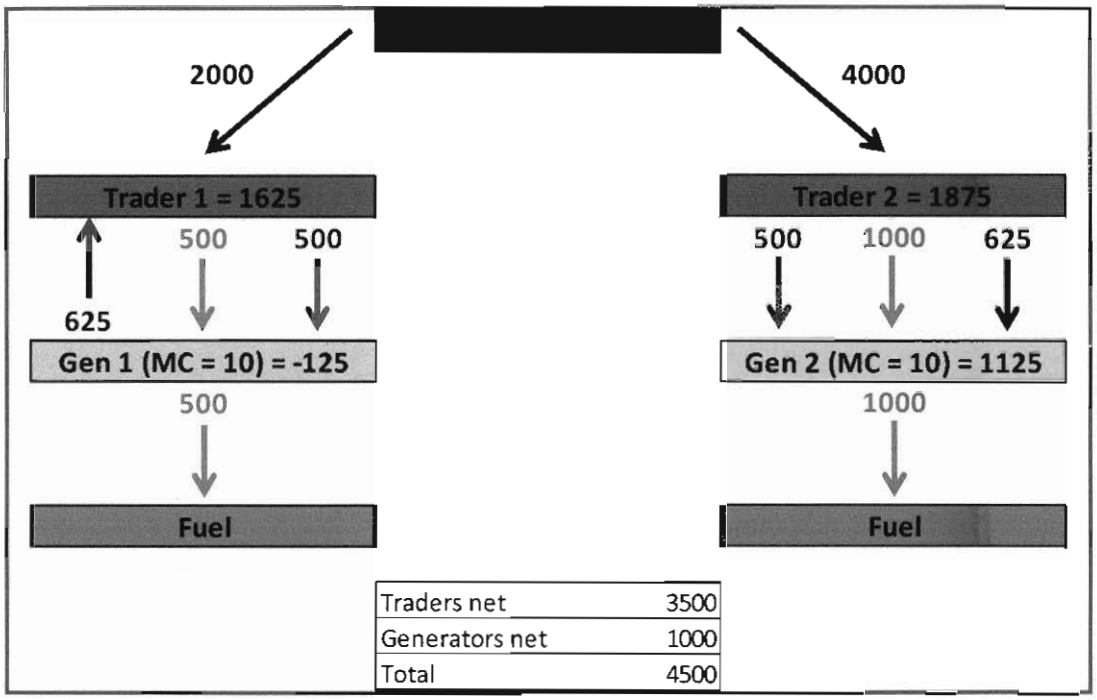

Figure 10: Net cash flows when one Generator experiences an outage

Gentrader 2 is made worse off as a result of the co-insurance arrangement during this event since *Gentrader 2* is required to forego the pool revenue it would otherwise have earned on the production from its non-firm capacity. It is important to note, however, that the level of firm capacity achieved by the Gentraders is higher with the co-insurance than without it, so both Gentraders benefit in this regard. In effect, the foregone pool revenue during co-insurance events is the cost of this increase in the quantity of firm capacity available to the Gentraders under the co-insurance arrangement. Over time, *Gentrader 2* is likely to require co-insurance payments when *Generator 2* experiences an outage, and so also benefits from the co-insurance agreement via the reduction in exposure to the risk of unfunded difference payments.

Importantly, the loss of non-firm revenues resulting from the co-insurance event provides Gentraders with an incentive to invest in operations and maintenance (since they potentially forego non-firm revenues when they have an outage or supply co-insurance), and provides individual Generators with an incentive to take actions which minimise the likelihood of outages (since they suffer a penalty if they call on coinsurance and/or cannot meet their firm capacity obligations).

This incentive for Generators to be reliable is further sharpened by the way in which responsibility for meeting co-insurance requirements is allocated (discussed in more detail in Section 0). Simply, the Gentraders who call on the most co-insurance will also supply the most co-insurance, and forgo non-firm pool revenues more frequently.

1.10 Cashflows and output when two Generators experience an outage

Consider the case in which each Generator has a one unit outage. In this case neither Generator can continue to run at full capacity, and output will be 50 MW for each Generator. We will assume that the remaining demand will be met from another generator in the system and that pool prices will remain at $40/MWh.

If the firm capacity requirements are not met, as is the case here, then the demand for co-insurance cannot be met. That is, both Generators require 25 MW of co-insurance and neither is in a position to supply any co-insurance.

In this case the Gentraders wear the risk of unfunded difference payments and the cashflows are the same as they would be in the absence of co-insurance.

These cashflows are shown in Figure 11.

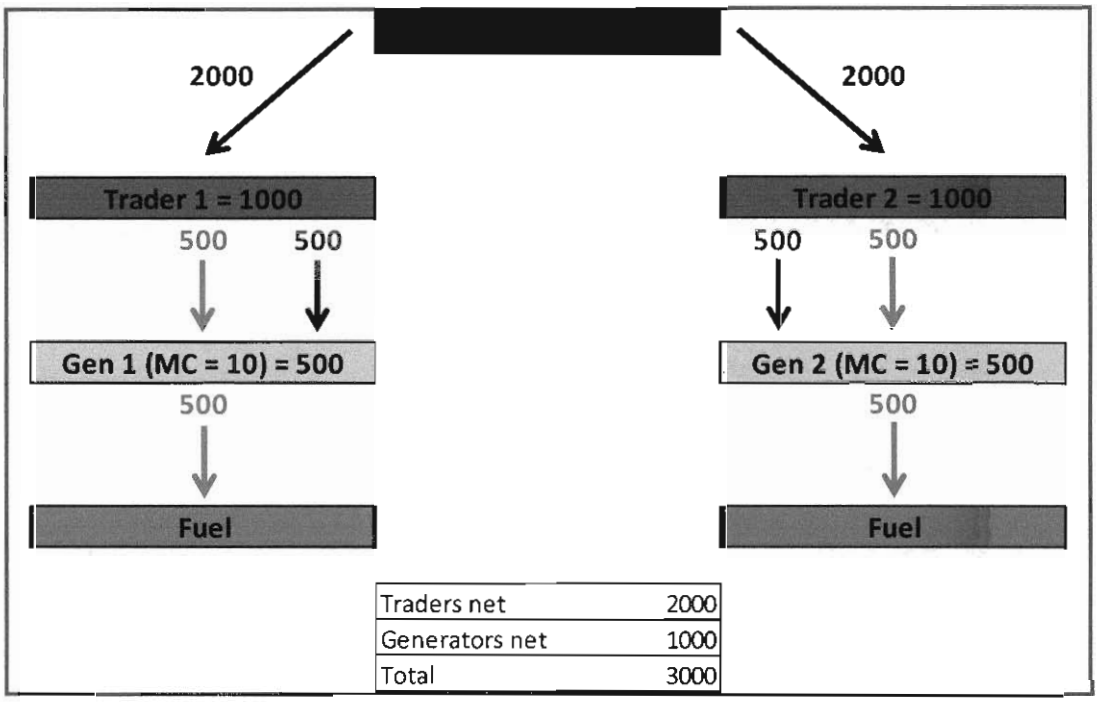

Figure 11: Net cash flows when two Generators experience outages

2. Calling and allocating co-insurance

In the two Gentrader case discussed in Section 1, it is always clear which Gentrader will be required to supply co-insurance. However, when there are three or more Gentraders, there needs to be an allocation rule to define which Gentrader(s) supply co-insurance during an outage. This section introduces the calling and allocation rules which will decide which Gentraders (and, hence, Generators) will be liable to make financial payments when a call on co-insurance is made.

Section 2.1 discusses the rules around calling co-insurance, particularly the inter-temporal issues around when payments become active. Section 2.2 sets out the allocation rules when there is an adequate supply of co-insurance and Section 2.4 discusses the allocation in the event of a shortfall. Finally, Section 2.5 discusses issues that arise when a single entity owns and operates more than one generator.

2.1 Calling co-insurance

Co-insurance is available to Gentraders whenever the available capacity from their Generator drops below the co-insurance firm capacity. In this case the Gentrader can call on co-insurance up to the difference between firm capacity and available capacity. For example, if a Gentrader's firm capacity is 1000 MW and their Generator declared available capacity is 800 MW then the Gentrader can call on up to 200 MW of co-insurance.

Gentraders are obligated to supply co-insurance when called upon. The amount available for supply is the difference between available capacity and firm capacity. For example, if a Gentrader's firm capacity is 1000 MW and available capacity is 1200 MW then it could be called upon to supply up to 200 MW of co-insurance. Gentraders can only ever supply co-insurance above their firm capacity.

The morphology of a basic co-insurance event is as follows:

1. *Generator A* declares available capacity to be less than firm capacity; then,
2. *Gentrader A* decides whether or not to call on co-insurance. Assuming that co-insurance is called on in full (firm less available capacity); then,
3. The scheme administrator determines the allocation of co-insurance supply. Assuming the total supply is met by *Gentrader B*; then,
4. *Gentrader B* is notified of the quantity they must supply (*Gentrader A*'s firm less available capacity) for each trading interval of the co-insurance event. Co-insurance payments do not become active until two full trading intervals have passed. The parties are liable to make payments as discussed in Section 1 for each trading interval that co-insurance is active; finally,
5. The co-insurance event ends when either:
    a. *Generator A* declares available capacity to be equal to or greater than *Gentrader A*'s firm capacity; or,
    b. *Gentrader A* ends the call on co-insurance (for example overnight, if spot prices are unlikely to exceed the co-insurance price).

It should be noted that responding Gentraders (in this example *Gentrader B*) are liable to make payments regardless of the level of output of their plant. If the responding Gentrader is already operating at or near full capacity then this is not a problem. However, if the responding Gentrader is operating at low levels for some reason they could potentially be liable for co-insurance payments that they are not able to recover via pool sales. For this reason co-insurance payments are not active until two full trading intervals after the call. This gives the responding Gentrader(s) time to ramp plant production up (if they wish to) in order to recover co-insurance payments via pool sales.

For example, if a Gentrader called on co-insurance at 12:15 then payments would not be active until the trading interval ending at 14:00 and would remain active until the co-insurance event ended. This means that the calling Gentrader is not covered by co-insurance for at least the first hour of any outage event. Two trading intervals was chosen as the appropriate period because this provides any of the power stations that is party to co-insurance with the opportunity to ramp up production by an amount equal to non-firm capacity before the co-insurance payments kicked in.

It is possible that a Gentrader who is supplying co-insurance could themselves have an outage. In this case co-insurance would need to be reallocated. There are two possible cases, as a results of the outage:

- available capacity remains above or equal to firm capacity; or
- available capcity drops below firm capacity.

In the former case co-insurance would be re-allocated such that this Gentrader supplied less (potentially no) co-insurance. In the latter case this Gentrader may wish to call on co-insurance. In this case the reallocation would involve this Gentrader now receiving co-insurance rather than supplying. In both cases the re-allocation would not take effect until two full trading intervals had passed. This means that this Gentrader would still be liable to supply co-insurance and make payments for the intervening two periods.

2.2 The surplus/deficit order

The method of allocating co-insurance is such that the Gentraders which call most regularly on co-insurance should be the first to supply co-insurance at a later date. Conversely, Gentraders who rarely call on co-insurance will be less likely to supply. This rule is typified by the surplus/deficit order. The surplus/deficit order will be a continuously updated tally of the supply and demand of co-insurance. For every hour that a Gentrader calls on 1 MW of co-insurance it will accrue 1 MWh of deficit. Similarly, a Gentrader who supplies 1 MW of co-insurance for an hour accrues 1 MWh of surplus. The surplus/deficit order is a cumulative tally of the supply and demand for co-insurance. At any point in time it implies an order from the Gentrader with the highest deficit to the Gentrader with the highest surplus.

In the event of a Gentrader calling on co-insurance, then the Gentrader with available capacity greater than firm capacity and the highest deficit is the first to supply. If this Gentrader is unable to meet the entire demand for co-insurance then the Gentrader with available capacity greater than firm capacity and the next highest deficit is the next to supply, and so on.

Using this allocation rule means that Gentraders have an incentive to maintain their plant and increase reliability via capital expenditure. When a Gentrader is called on to supply co-insurance they effectively forego pool operating profits to the calling Gentrader. As such, Gentraders wish to avoid being called on to supply co-insurance. The only way they can do this is if their power station is relatively more reliable than other power stations that are party to the co-insurance arrangement, such that they are further up the surplus/deficit order. In this manner, the co-insurance arrangement does not interfere with incentives to invest in the power stations in order to increase reliability.

The surplus/deficit order will not be published to the parties in real time but will be made available on a daily basis.

2.3 Example allocation using the surplus/deficit order

The following examples of the surplus/deficit order will consider a system of four Gentrader contracts over four power stations of equal size and firm capacity, each with two 500 MW units. Initially there is no outage and we have also assumed a pre-existing surplus/deficit order. These details are summarized in Table 3. No outages are occurring and all Gentraders have 200 MW of potential co-insurance

supply. The surplus/deficit order indicates that Gentraders will supply in the following order (lowest to highest): 2, 1, 3 then 4.

Gentrader	Available capacity (MW)	Firm capacity (MW)	Capacity available to supply co-insurance (MW)	Demand for co-insurance (MW)	Surplus/ deficit order (MWh)	Co-insurance received (MW)	Co-insurance supplied (MW)
1	1000	800	200	0	-200	0	0
2	1000	800	200	0	-400	0	0
3	1000	800	200	0	200	0	0
4	1000	800	200	0	400	0	0

Table 3: Initial data for allocation example (no outage)

Assume that *Generator 3* experiences a single unit outage at 12:15 on this example day and immediately informs *Gentrader 3* and the Administrator that available capacity has dropped to 500 MW. At this time *Gentrader 3* decides to call on co-insurance in full. This equates to calling for 300 MW, the difference between firm capacity and available capacity. The Administrator determines the allocation based on the surplus/deficit order. Gentrader 2 is the Gentrader with the lowest surplus/deficit and is first to supply, however Gentrader 2 is only ever called to supply up to 200 MW of co-insurance. The balance of demand for co-insurance (100 MW) is met by Gentrader 1. This allocation does not become active until two full trading intervals have passed. This equates to the interval ending 14:00. The Administrator notifies Gentraders 1, 2 and 3 of the allocation of co-insurance and the time that it becomes active as soon as possible after the call has been made by Gentrader 3. Gentrader 4 is not informed in real time. The supply and demand of co-insurance is summarised in Table 4.

Gentrader	Available capacity (MW)	Firm capacity (MW)	Capacity available to supply co-insurance (MW)	Demand for co-insurance (MW)	Surplus/defi cit order (MWh)	Co-insurance received (MW)	Co-insurance supplied (MW)
1	1000	800	200	0	-200	0	100
2	1000	800	200	0	-400	0	200
3	500	800	0	300	200	300	0
4	1000	800	200	0	400	0	0

Table 4: Gentrader 3 calls on co-insurance at 12:15, allocation is determined to start from interval ending 14:00

Throughout the co-insurance event the surplus/deficit order changes to reflect co-insurance supplied and received in MWh's. This is shown in Table 5. As of the interval ending 13:30 there is no change as co-insurance is not yet active. From the interval ending 14:00, both *Gentrader 1* and *Gentrader 2* accrue surplus MWh's to reflect their supply while *Gentrader 3* accrues deficit MWh's to reflect co-insurance received.

Gentrader	Allocation (MW)		Surplus/deficit order (interval ending, MWh)				
	Co-insurance received	Co-insurance supplied	13:30	14:00	14:30	15:00	15:30
1	0	100	-200	-150	-100	-50	0
2	0	200	-400	-300	-200	-100	0
3	300	0	200	50	-100	-250	-400
4	0	0	400	400	400	400	400

Table 5: Changes to the surplus/deficit order during the co-insurance event (allocation active as of interval ending 14:00)

From the interval ending 14:00 onwards payments are being made between the three involved Gentraders and their respective Generators as per the description in Section 1. These payments are in general of the form:

$(P - P_{CI}).Q_{CI}$, where Q_{CI} is the relevant quantity in MWh's

In summary, for each half hour that co-insurance is active, payments are made as follows:

- Gentrader 2 pays Generator 2 an amount $(P - P_{CI}).200/2$;
- Gentrader 1 pays Generator 1 an amount $(P - P_{CI}).100/2$; and,
- Generator 3 pays Gentrader 3 an amount $(P - P_{CI}).300/2$.

Note that division by two has been included to make it explicit that the allocation is in MW's whilst the payments (and surplus/deficit order) involve MWh's.

In the final interval shown in Table 5 we see that the surplus/deficit order for both *Gentrader 1* and *Gentrader 2* is equal at value 0 MWh's. When this occurs a reallocation of co-insurance is required such that the supplying Gentraders remain equalised in the surplus/deficit order. Table 6 shows the new allocation, which is active from the interval ending 16:00, and further changes to the surplus/deficit order over time. Payments between the parties change in accordance with the new allocation. The Administrator would notify *Gentrader 1* and *Gentrader 2* of the new allocation at 14:30, two full periods before it came into effect at 15:30 (for the interval ending 16:00). *Gentrader 3* would not be given any new information as its allocated supply of 300 MW has not changed. *Gentrader 4* would also not be informed of any changes.

If the co-insurance event continued then *Gentrader 4* would eventually be allocated to supply also. At that stage each supplying Gentrader would be allocated to supply 100 MW's of co-insurance and that would continue until the end of the event or an additional outage cause a further re-allocation.

Gentrader	Allocation (MW)		Surplus/deficit order (interval ending, MWh)				
	Co-insurance received	Co-insurance supplied	15:30	16:00	16:30	17:00	17:30
1	0	150	0	75	150	225	300
2	0	150	0	75	150	225	300
3	300	0	-400	-550	-700	-850	-1000
4	0	0	400	400	400	400	400

Table 6: Changes to the surplus/deficit order during the co-insurance event (allocation active as of interval ending 14:00)

2.4 Example where demand for co-insurance exceeds available supply

Now assume that *Generator 4* has a single unit outage at 16:45. *Gentrader 4* then chooses to call on co-insurance in full for 300 MW. Demand for co-insurance from *Gentraders 3* and *4* (600 MW) now exceeds available supply from *Gentraders 1* and *2* (400 MW). In this case, as is always the case, co-insurance is allocated according to the surplus/deficit order. *Gentrader 4* has a greater surplus than *Gentrader 3,* as such *Gentrader 4* receives the full 300 MW it demands. *Gentrader 3* receives the residual supply of 100 MW. All parties are notified of the new allocation by 17:00 and it becomes active for the interval ending 18:30. This is shown in Table 7. If the co-insurance event continues then eventually *Gentraders 3* and *4* will equalise on the surplus/deficit order. In this case co-insurance will be re-allocated between them equally in analogy to the supply side example given previously.

Gentrader	New Allocation (MW, active interval ending 18:30)	Surplus/deficit order (interval ending, MWh)

	Co-insurance received	Co-insurance supplied	18:00	**18:30**	19:00	19:30	20:00
1	0	200	375	**475**	575	675	775
2	0	200	375	**475**	575	675	775
3	100	0	-1150	**-1200**	-1250	-1300	-1350
4	300	0	400	**250**	100	-50	-200

Table 7: Changes to the surplus/deficit order during the revised co-insurance event (new allocation active as of interval ending 18:30, shown in bold)

2.5 Common ownership of power stations

Under the allocation rule discussed above, a potential issue arises where a single entity owns and operates more than a single generator, for example Macquarie Generation with Bayswater and Liddell. If a single entity is supplying co-insurance with one power station and receiving co-insurance on another power station then the Generator, as a single entity, is essentially indifferent to whether co-insurance is called or not. That is, the incentives promoted by the inter-generator payments cease to exist. However, for the reasons set out below, this is unlikely to be a real issue.

In this case one of the Gentraders could offer a financial incentive to the Generator to falsely declare an outage. This would allow that Gentrader to call on co-insurance which would be supplied by the other Gentrader associated with the Generator. This can only work if the Generator is certain that it will be their plant that both receives and supplies co-insurance such that the payments balance.

For example, using Macquarie Generation, assume that the Gentrader for Liddell is the next in line under the surplus/deficit order and all parties are aware of this. In this case the Gentrader for Bayswater could offer Macquarie Generation a payment to declare a false outage.[27] The Gentrader for Bayswater could then call on co-insurance, this would result in:

- The Liddell Gentrader making payments to Macquarie Generation; and,
- Macquarie Generation making payments to the Bayswater Gentrader.

Note that the payments cancel out for Macquarie Generation, so it is indifferent to the co-insurance event. However, the Bayswater Gentrader suffers reduced dispatch, potentially benefits from an increase in pool prices and also receives co-insurance payments. The Liddell Gentrader also potentially benefits from an increase in pool prices but has to forego non-firm pool operating profits to the Bayswater Gentrader. In this manner, the co-insurance arrangement could be used to defraud the Liddell Gentrader, who is ultimately out of pocket.

Ultimately, the NSW Government considers that this will not be an issue. Making false availability declarations will constitute a breach of the Gentrader contract and the co-insurance contract. Under the Gentrader contract, Gentraders will have an audit right to ensure that availability declarations are true.

Similar arrangements will be available under the co-insurance contract: any party to the agreement (Gentrader or Generator) will have the right to request that the Administrator undertake an audit of a Generator's availability declaration. If this audit finds that an availability declaration is false, then all payments that were made as part of the co-insurance event(s) would be reversed, including changes to the surplus/deficit order, and an additional penalty would be applied to the offending Gentrader and Generator, which would include the cost of the audit. In the event that the audit found the declaration to be valid, then the requesting party would be liable to pay for the audit.

[27] Presumably this would result in an increase in pool prices due to capacity being withdrawn from the market.

3. Determining the co-insurance firm quantity and allocation

This section sets out the methodology used to determine the quantity of firm capacity to be provided to Gentraders under the co-insurance arrangement. The allocation amongst the Gentraders is also discussed.

There is a trade off in setting the firm capacity levels. Gentraders will always value higher levels of firmness, with maximum value being associated with 100% firm capacity. In practice however, generators cannot be 100% firm at their nameplate capacity. For example, a system of eight 500 MW units (for a total of 4,000 MW) would be able to offer 100 MW of capacity with near enough to 100% firmness, but would not be able to offer 3,900 MW with 100% firmness as there is a non-zero probability of outages over any significant timescale at 3,900 MW of supply. As such, the level of firm capacity is proportional to the probability that there is insufficient supply. Put another way, setting a high firm capacity increases the likelihood that the plant stock will not be able to meet that level at all times. This effect is discussed and quantified in Section 3.2.

The main consideration in determining the likelihood of a shortfall in supply below the firm level is the number of units involved in the arrangement and data for each unit regarding its expected outages (both forced and planned).[28] Using this data it is possible to consider every combination of possible full outages amongst the participating units. For each of these combinations a probability can be assigned, as discussed in Section 3.1. By assuming some allocation of co-insurance, for example a flat percentage firm capacity across all the Gentraders, it is also possible to determine the supply and demand of co-insurance for each of these outage combinations including any instances of supply shortfalls. By repeating this calculation for different assumed co-insurance levels it is possible to determine a relationship between the assumed co-insurance level and the probability of a shortfall in the supply of co-insurance.

3.1 Probability of outages

This section presents the generalised mathematical approach for determining the probability that an assumed level of co-insurance can be provided over a given period of time (e.g. a year).
The probability of simultaneous unit outages can be determined using the binomial theorem. In simple terms the probability of k simultaneous unit outages, in a portfolio of n units, where each unit has probability of outage p is given by the binomial theorem:

$$P_n(k) = \binom{n}{k} p^k (1-p)^{n-k}$$

where:

$$\binom{n}{k} = \frac{n!}{k!\,(n-k)!}$$

Further, the probability that there are no more than j simultaneous unit outages is given by:

$$P_n(\leq j) = \sum_{k=0}^{j} \binom{n}{k} p^k (1-p)^{n-k}$$

The above equations assume that each unit experiences a full outage (as opposed to a partial outage), each unit experiences an outage with equal probability, and that each unit is equal in size.

To determine the amount of firm capacity across the entire 18 unit system[29] under consideration, a generalisation of the above approach is employed. In this model each unit u has 2 possible states

[28] Equivalently, since we are not differentiating between different types of outages or full versus partial outages, we can take the overall expected outage rate to be one less the expected availability factor.
[29] The firm co-insurance quantity is determined for the system of State-owned baseload generators, excluding the two Munmorah units.

(available or unavailable) with a probability of an outage given by p_u. Given this, there are 2^{18} possible combinations, C, of outages, each with a probability:

$$P(C) = \prod_u P(c_u)$$

where c_u is the state of unit u in combination C.

That is, the probability that combination C occurs (for instance, that Bayswater experiences a single unit outage, but all other units are available) is the product of the probabilities of each individual state c_u (the probability that unit one of Bayswater is unavailable multiplied by the probability that every other unit is on).

If c_u is assigned a value of *0* when the unit is unavailable and *1* when the unit is available then the probability that unit u is in state c_u reduces to a simple form of a binomial distribution given by:

$$P(c_u) = p_u^{\,c_u}(1-p_u)^{1-c_u}$$
$$c_u = 0,1$$

For example, the probability that only the first unit has an outage and all others are available is the product of the probability that the first unit experiences an outage multiplied by the probability that the second unit is available multiplied by the probability that the third unit is available, etc.

Using the methodology above, for each unique combination of full unit outages across the 18 unit system we can determine a probability that this given state will occur.

3.2 Firm capacity availability curve

The model described above can be used to calculate the probability of each individual combination of outages. In order to reduce the required calculations from 2^{18} – the total number of combinations of outages – it is assumed that each unit in a given station has the same outage rate (this assumption can be relaxed, and indeed will be relaxed for the final calculation). This reduces the problem to a more manageable $5^3*3^3 = 3,375$ combinations[30].

For an assumed level and allocation of co-insurance it is also possible to determine the supply and demand of co-insurance, including any supply shortfalls. Figure 12 shows how the probability of shortfalls increases as the firm capacity level is increased. This figure assumes that co-insurance is set as a percentage of total installed capacity and allocated amongst the Gentraders by capacity.

[30] The 5^3 term comes from the three 4-unit stations, which each have five possible states – 0, 1, 2, 3 or 4 outages. The 3^3 comes from the three 2-unit stations, which each have three possible states – 0, 1 or 2 outages. Munmorah has been excluded.

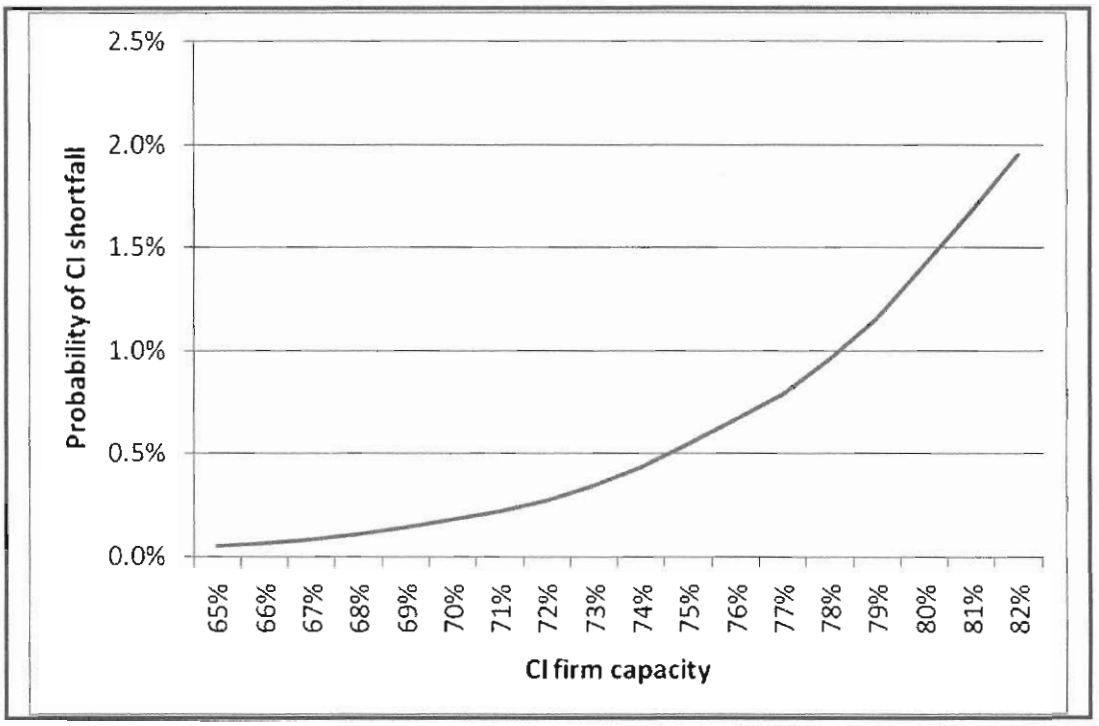

Figure 12: Probability of a shortfall of co-insurance as a function of the co-insurance level (assumes co-insurance is allocated by capacity).

Intuitively, Figure 12 shows how the likelihood of a shortfall of capacity increases with the assumed co-insurance level. For example, if the co-insurance level was set at 75% of participating plants' capacity then there would be approximately a 0.5% chance that this co-insurance quantity could not be met for a given half hour. Put another way, you would expect co-insurance to be pseudo-firm for 0.5% of any given year.

Note that this firm co-insurance level protects the Gentrader against both forced and planned outages. As such a co-insurance level of 75% across the whole year is significantly better than a Gentrader with four units self-insuring against both forced and planned outages.[31]

3.3 Allocation of firm availability to Gentraders

The calculations above have been carried out assuming that the available co-insurance is allocated to Gentraders on a capacity basis. If all the plant were equally reliable then this allocation would not result in a transfer of value between the plant and the associated Gentrader contracts.

In practice this is not the case – some plant are more reliable than others. As such, an allocation by capacity would represent a transfer of value from more reliable plant to less reliable plant. This may not be desirable as bidders for the Gentrader contracts would need to discount/inflate their offers for the period of the co-insurance contract (as part of their overall Gentrader contract bid). As such, it is likely to be preferable to allocate the co-insurance according to expected reliability.

[31] While the Gentrader could be expected to consider 75% of capacity firm (N-1) for at least part of the year this would not be the case during planned maintenance events.