AEMC

REVIEW

Australian Energy Market Commission

ISSUES PAPER

NEM financial market resilience

Commissioners

Pierce
Henderson
Spalding

8 June 2012

Submissions due 20 July 2012. Reference: EMO0024
Issues Paper

Inquiries

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

E: aemc@aemc.gov.au
T: (02) 8296 7800
F: (02) 8296 7899

Reference: EMO0024

Citation

Australian Energy Market Commission, NEM financial market resilience, Issues Paper, AEMC, 8 June 2012, Sydney

About the AEMC

The Council of Australian Governments (COAG), through its then Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. In June 2011, COAG announced it would establish the new Standing Council on Energy and Resources (SCER) to replace the Ministerial Council on Energy. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the SCER.

Executive summary

This issues paper commences a new project in relation to advice that we have been asked to provide to the Standing Council on Energy and Resources (SCER) regarding potential risks arising from financial interdependencies between participants in the National Electricity Market (NEM).

Context for this advice

Generators, retailers and other businesses that participate in the NEM have complex financial relationships with each other. Those relationships primarily arise from the financial contracts that market participants use to hedge their exposure to the wholesale spot price for electricity, which is highly volatile.

These financial relationships create a high level of financial interdependency between market participants. As a result, there is a risk that if one participant encounters significant financial difficulties, those difficulties could be transmitted to other participants. That could potentially result in financial contagion that affects several businesses and the efficiency of the market.

Generators and retailers currently adopt a range of risk management strategies to manage these risks. They are also subject to the requirements of financial regulators and external parties such as brokers and exchange operators, which may mitigate some of these risks.

Our initial view is that the financial relationships and markets that underpin the efficient operation of the NEM are generally robust.

However, energy and financial markets around the world have been subject to periods of significant stress in recent years.

In particular, the global financial crisis and the failure of financial businesses such as Lehman Brothers demonstrated the potential for high levels of financial interdependency to cause the financial difficulties of one market participant to be transmitted to other participants and cause financial contagion that threatens overall market efficiency. The potential for financial contagion in electricity markets, although on a lesser scale, was best demonstrated by the Californian electricity crisis of 2000/2001, which led to the collapse of two of the largest electricity businesses in the State and the need for substantial government intervention to avoid broader contagion.

SCER request for advice

Against this background, SCER has asked us to work with stakeholders to provide advice on:

- the nature of the risks to financial stability in the NEM arising from financial interdependencies between market participants;

- whether the existing mechanisms to mitigate these risks are adequate; and
- if necessary, options to strengthen those existing mechanisms and minimise the identified risks and their consequences.

Scope of our advice and this paper

Our advice will consider the nature of risks to the NEM arising from financial interdependencies between market participants.

In particular, we will assess whether the financial relationships and markets underpinning the NEM are sufficiently resilient to manage an unexpected event or series of events that could result in one participant's financial distress being transmitted to other participants and causing financial contagion that could hinder achievement of the national electricity objective.

The Commission considers that there is low likelihood of an unexpected event or series of events in the NEM causing financial contagion. However, it considers it prudent to determine the extent to which the risk of financial contagion exists in electricity financial markets and to consider possible strategies to reduce that risk or mitigate any consequences of contagion.

This paper outlines our initial views on the nature of the relationships and financial interdependencies between NEM participants and the potential risks that could arise from those interdependencies.

It sets out our initial analysis of examples of scenarios where a series of unusual and unexpected events could, in certain circumstances, lead to financial contagion that could damage the long term interests of consumers. It also explains the risk management practices that we would expect a prudent generator or retailer to adopt to manage those risks, and the external risk management requirements that those parties are subject to.

Initial focus for our advice

The initial objective of our advice is to identify the nature of the potential risks arising from the financial interdependencies between participants and test our understanding of those risks with stakeholders.

Based on our initial analysis, we consider that the key risks of financial contagion arise in the event of the failure of a large retailer that triggered the operation of the retailer of last resort arrangements. Accordingly, the impacts of such a scenario will be the main initial focus of our advice.

Stakeholder input

We have prepared this issues paper with assistance and input from an industry working group. The working group has assisted us to develop our understanding of the nature of the financial relationships between participants, the potential risks arising from those relationships and the measures that participants currently adopt to manage those risks.

We have also established an advisory committee comprised of representatives of the Australian Energy Market Operator, the Australian Energy Regulator, the Australian Securities and Investments Commission and SCER officials.

Input from a broad range of stakeholders, in addition to the working group and advisory committee, will be critical to assist us with identifying the nature of the potential risks and test the initial analysis set out in this paper. Any options for reform that may arise from this project will also be consulted on broadly with stakeholders before we make any final recommendations to SCER.

We look forward to comments on the issues discussed in this paper.

Contents

1 About this project

1.1 Introduction

This project is about the financial relationships between participants in the National Electricity Market (NEM). Those financial relationships are complex and lead to a high degree of financial interdependency between market participants, primarily due to their exposure to a common spot price for electricity and their hedging arrangements to manage exposure to that spot price.

In this paper, we use the term 'NEM financial markets' as a short-hand expression to refer to those financial relationships between NEM participants, the various hedge products used by participants, the financial markets that participants use to trade those hedge products, and the NEM and broader financial market rules that regulate those relationships, hedge products and markets.

The efficient operation of the NEM relies on these financial markets. NEM financial markets are generally robust and have been able to evolve to accommodate major events and changes in market circumstances.

However, energy and financial markets in other parts of the world have undergone periods of stress in recent years. In particular, the recent global financial crisis has highlighted the potential for the financial relationships and interdependencies between market participants to cause the financial difficulties of one participant to be transmitted to other participants and threaten overall market efficiency.

In this context, we have been asked by the Standing Council on Energy and Resources (SCER) to consider how well the financial markets underpinning the NEM are placed to respond to potential challenges. In particular, it is in the interests of market participants and consumers alike to consider whether these NEM financial markets are sufficiently resilient to withstand an unexpected and unusual series of events that could result in one participant's financial distress being transmitted to other participants and cause financial contagion and broader market instability. Such financial contagion could damage the achievement of the national electricity objective (NEO) and the long term interests of consumers.

1.2 Standing Council on Energy and Resources request for advice

At its December 2011 meeting, SCER requested that the Australian Energy Market Commission (AEMC), with input from market participants, provide advice on any risks to the efficient functioning of the NEM arising from financial interdependencies between market participants as a result of their exposure to a common spot price and their hedging arrangements.

The communique to that meeting states:[1]

> "While National Electricity Market (NEM) participants need to manage their own financial and commercial positions, Ministers noted that there are significant financial interdependencies that exist between these parties, arising through exposure to a common spot price and their hedging arrangements to mitigate volatility in this spot price.
>
> Ministers agreed that it is important that these financial interdependencies and any implications for the stability of the market are well understood by market participants, market bodies and policy makers. Ministers requested that, with the input of market participants and other stakeholders, the AEMC identify the nature of any risks to the efficient functioning of the market arising from these interdependencies and recommend mechanisms for addressing such risks for consideration by SCER."

SCER's request for advice states that the AEMC is to provide advice on:

- the nature of the risks to the NEM arising from financial interdependencies between market participants; and
- appropriate mechanisms to minimise those risks and consequences if deemed necessary.

SCER seeks to understand better:

- the risks to financial stability in the NEM arising from financial interdependencies between participants and the impacts of those risks if they materialise and result in financial instability;
- the existing mechanisms to mitigate risks to financial stability and manage the consequences in the NEM, and whether they are adequate;[2] and
- if existing mechanisms are inadequate, options to strengthen, enhance or supplement them and minimise these risks and their consequences.

The request for advice provides that the AEMC is to consider the following, amongst other things, in preparing its advice:

- the NEO;
- recent developments in electricity markets in other jurisdictions;
- approaches to financial stability regulation in other markets;

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1 SCER meeting communique, 9 December 2011.

2 The request for advice notes that these mechanisms can be distinguished from mechanisms to mitigate risks to the physical integrity of the electricity system, which are well established.

- relevant developments in the regulation of financial markets in Australia and other jurisdictions;
- relevant work being undertaken by the Council of Financial Regulators;
- the role of the Australian Securities and Investments Commission (ASIC), and obligations on participants, under the *Corporations Act 2001* (Cth); and
- transitional mechanisms related to the introduction of a price on carbon.

SCER's request for advice is available on the AEMC website.

1.3 Initial focus and timing for our advice

The initial focus for our advice will be identifying the nature of the potential risks to achievement of the NEO arising from financial interdependencies between participants and testing that understanding with stakeholders.

This paper explores the possible effects of the financial failure of a large generator or retailer. Our initial analysis in chapter 5 discusses the potential for such a failure to lead to financial contagion that impacts other participants and the achievement of the NEO in certain circumstances. However, this paper also explains the range of risk management strategies that participants currently adopt to mitigate these risks.

Our analysis indicates that whatever causes the initial failure of a participant (either a generator or retailer), the financial interdependencies between participants create a risk that the initial failure could have significant financial implications for other participants and in extreme circumstances could lead to a large retailer failing. In certain circumstances, the operation of the retailer of last resort (ROLR) arrangements could exacerbate the spread of that contagion to multiple participants.

As a result, our initial view is that it is appropriate to focus first on the risks of the failure of a large retailer and the implications of the ROLR arrangements following such a failure.

Our target is to publish a first interim report on those issues, including options to address any risks that we identify, by December 2012. Our ability to meet this target will depend on achieving sufficient input from stakeholders.

1.4 Stakeholder engagement

1.4.1 Industry and stakeholder participation

The nature of the issues that will be considered as part of this advice mean that the involvement of market participants and other stakeholders is particularly important.

We have established a small working group of industry stakeholders whose expertise will be a critical input to our advice. Market participants are best placed to explain the

nature of the financial relationships in the NEM and the potential risks arising from those relationships, and describe the measures that prudent companies undertake to mitigate those risks. The involvement of market participants will also help ensure that any recommendations arising from this advice can be implemented effectively.

We will work closely and collaboratively with the industry working group in developing our advice. This paper has been prepared with the working group's input and assistance. However, the views expressed in this paper are not to be attributed to individual members of the working group, or to the companies that provided resources and input.

The companies represented on the working group are:

- AGL Energy;
- Alinta Energy;
- Australian Power and Gas;
- International Power GDF Suez;
- Loy Yang Marketing Management Company;
- Origin Energy; and
- TRUenergy.

We have also established an advisory committee to help ensure that any recommendations consider all relevant policy and regulatory requirements. It comprises representatives from:

- the Australian Energy Regulator;
- the Australian Energy Market Operator;
- the Australian Securities and Investment Commission (ASIC); and
- SCER officials.

The advisory committee will comment and provide input at each stage of the project, and its views will be taken into account by the AEMC in developing recommendations.

Engagement with a broader range of stakeholders is also important. The publication of this paper commences the process of broader stakeholder engagement. We seek stakeholders' comments on the issues raised in this paper, in particular whether we have accurately characterised the nature of potential risks to financial stability in the NEM.

We will publish further papers and invite comment on those papers before providing our final advice and recommendations to SCER. We look forward to stakeholder responses to this and subsequent papers.

1.4.2 How to make a submission

Specific questions on which we seek stakeholders' comments are set out in chapter 6.

The closing date for submissions to this paper is **20 July 2012**.

Submissions should quote project number "EMO0024" and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

2 Overview of the financial relationships between NEM participants

2.1 The electricity spot market

The Australian Energy Market Operator (AEMO) operates the wholesale electricity market. Electricity generators that participate in the NEM sell all of their electricity through this market. Electricity retailers purchase almost all of their electricity to supply their consumers through this market. This wholesale market is referred to as the 'spot market'.

The operation of the spot market is supported by an interconnected transmission network that connects the six participating jurisdictions of the NEM (South Australia, Tasmania, Victoria, New South Wales, the ACT and Queensland) and a series of distribution networks that connect consumers to the network. Generators and customers in all regions of the NEM are therefore connected to each other.

In operating the spot market, AEMO balances the supply and demand of electricity in real time. It calculates a dispatch price every 5 minutes, with that price being set to the level that is necessary to ensure that supply and demand are equal while minimising the cost of energy production. AEMO also calculates a price for every 30 minute 'trading interval' (based on the average of the six constituent dispatch interval prices). This price is referred to as the 'spot price', and is used as the basis for settlement by AEMO and in the financial contracts that are discussed in section 2.3.

Generators receive the spot price for all electricity they sell on the spot market in each trading interval (subject to some adjustments). Retailers pay the spot price for all electricity that their consumers use in each trading interval (also subject to some adjustments). A separate spot price is calculated for each of the five NEM regions, but those prices are generally similar unless there are constraints on the transmission network.

2.2 Spot price volatility

The spot price can be highly volatile. It can vary from $12,500 per megawatt hour (MWh) to -$1,000/MWh.[3]

Spot price volatility and the potential for high spot prices is an intentional and important feature of the design of the NEM. Periods of high spot prices act as a signal that new investment is required. They also ensure that a generator has an opportunity to recover its efficient costs, particularly given that spot prices can be very low or negative at other times. High prices can also provide an incentive for demand side

3 This maximum price cap is indexed annually and will increase to $12,900 on 1 July 2012.

participation, for example for large users to reduce their consumption during periods of high demand.

Retailers manage spot price risks on behalf of consumers, by charging customers a fixed price that shields them from direct exposure to spot price volatility.[4] While this is a key function of electricity retailers, the spot price volatility can create significant risks for retailers. For example, just one hour at the market price cap of $12,500/MWh would result in a large retailer incurring spot market liabilities of several million dollars to cover the electricity used by its customers.

Spot price volatility also creates risks for generators, due to the risk of periods of low prices. Generation investment involves large fixed costs, and significant ongoing operating and maintenance costs. But the generator will not have any certainty as to the spot market revenue that it will receive from operating. If spot prices are below the generator's costs on a sustained basis, it will encounter financial difficulties.

Generators and retailers seek to manage these risks associated with spot price volatility by entering into a range of financial relationships with each other and with other financial market participants. It is those financial relationships that are the focus of this paper and our advice.

2.3 Financial relationships between market participants to manage spot price volatility

Generators and retailers primarily manage spot price volatility by entering into financial instruments that are known as 'derivative' or 'hedge' contracts.

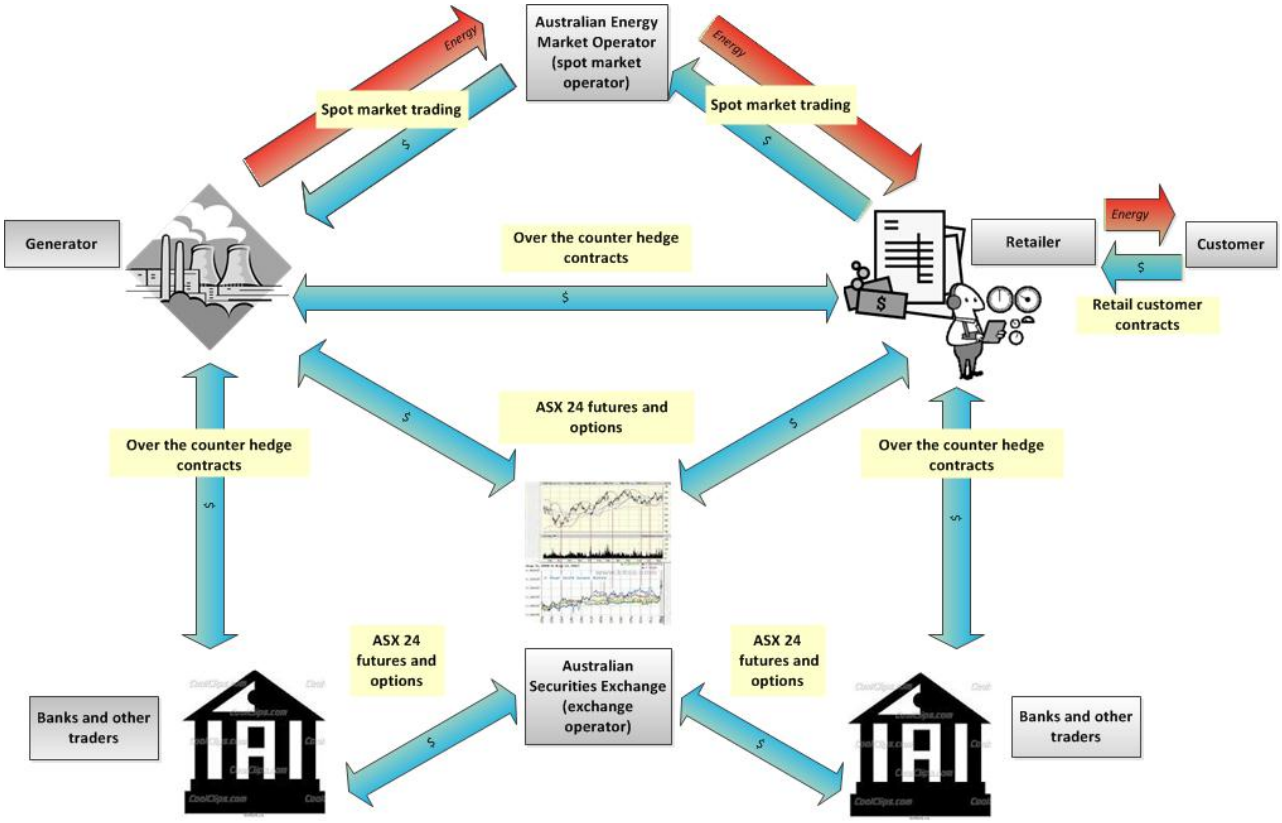
A derivative is simply an instrument that derives its value from something else - in this case the spot price of electricity. These instruments are used by generators and retailers to 'hedge' their spot price exposure.

The main purpose of entering into these types of financial instruments is to place bounds on the future electricity prices that a generator will receive or a retailer will pay. They do this not by changing the spot price that the retailer or generator pays or receives, but by creating an off-setting payment or revenue stream that balances out the change in the spot price, therefore hedging the generator or retailer's spot price exposure.

The web of financial relationships between market participants, including their spot market trading and the key types of hedge instruments that they use to manage spot price volatility, is illustrated in the following simplified diagram.

4 Retailers generally have little ability to pass high spot prices on to their customers, at least in the short term. Retailers charge most consumers a fixed price for their electricity, or have a limited ability to change their prices. In several jurisdictions, prices for retail consumers are regulated.

Figure 2.1 Financial relationships between market participants



Customers' only financial relationships with market participants are with their retailer, who supplies them electricity and bills them for that electricity.

The physical delivery of electricity only occurs through the spot market. All of the other relationships between market participants in this diagram only involve financial payments and not the supply of electricity.

As shown on this diagram, the two key ways in which generators and retailers manage spot price risks are:

- Entering into over the counter (OTC) hedge contracts. These contracts are usually entered into between a generator and a retailer. A generator or retailer may also enter into an OTC contract with another financial market participant who is acting as a speculator or an intermediary and seeking to make a profit from the transaction.

- Trading futures or options on an exchange. The only electricity derivatives exchange currently operating in Australia is the Australian Securities Exchange (ASX).[5]

5 This exchange was previously operated by the Sydney Futures Exchange (SFE), which merged with the ASX in 2006. For historical reasons, some people still refer to it as the SFE.

Not shown on the diagram are the brokers which act as agents for negotiation between participants. OTC contacts may be negotiated directly between the participants, or through brokers. Exchange-traded futures and options may be executed through a broker or a clearer.

OTC contracts and exchange-traded contracts, and how generators typically use them to manage risk, are explained in the following sections.

2.3.1 Over the counter hedge contracts

Retailers and generators use OTC contracts to hedge the spot price risks that they each face.

An OTC contract is a confidential contract between the parties. It is usually documented under the International Swaps and Derivatives Association (ISDA) Master Agreement, which sets out standard terms. However, one of the key benefits of an OTC contract is that the parties can tailor the terms of the contract as much as they wish to suit their particular circumstances.

A simplified example of how one of the most common types of OTC contracts, a swap contract, would be used by a retailer is set in the box below.

Box 2.1: Example of how a retailer uses an OTC contract to manage spot price risk

In this example, the retailer enters into an OTC swap contract with a generator at a contract price of $40/MWh. The retailer buys electricity from the spot market at the prevailing spot price. However, if the spot price differs from the 'strike price' agreed under the OTC contract, the retailer either pays the generator the difference (if the spot price is lower than the strike price) or receives a payment from the generator equal to the difference (if the spot price is higher than the strike price).

As a result, the net amount that each of the retailer and generator pay and receive for the contracted volume of energy is equal to the agreed strike price under the OTC contract, regardless of the level of the spot price. This means that neither of them is exposed to spot price volatility for the contracted volume of energy, provided that they each honour their obligations under the contract.[6]

However, as this advice will explore, each party takes on a risk that the other party may be unable to meet its payment obligations under the OTC contract. This is a key source of the financial interdependencies between participants.

The most common types of OTC contracts that are available are explained in the following table.

Table 2.1 Common types of OTC contracts

Name	Description
Swaps	The parties effectively swap the payment/receipt of the NEM spot price for the payment/receipt of an agreed strike price under the contract. As shown in the example in box 2.1, the strike price and the spot price are netted and the difference is paid by one party to the other party. Swaps are also referred to as 'contracts for differences'.
Caps	The parties agree on a strike price for the cap. If the spot price exceeds this strike price, the seller of the cap (usually a generator) must pay the difference to the buyer of the cap (usually a retailer). A common strike price for a cap contract is $300/MWh. In return, the buyer of the cap will pay the seller a fee, which provides the generator with an extra source of revenue. Buying such a cap helps protect the retailer from high spot prices.
Floors	The opposite of a cap. The parties agree on a strike price. If the spot price is less than this strike price, the seller of the floor (usually a retailer) must pay the difference to the buyer of the floor (usually a generator). The buyer of the floor will pay the seller an additional fee. Buying a floor helps protect the generator from low spot prices.
Options	A right to enter into another form of OTC contract (usually a swap or a cap) at a later date at a fixed price. For example, an option may give a generator a right (but no obligation) to enter into a swap at a later date for an agreed strike price. In return for this right, the buyer of the option will pay the seller a fee.
Asian options	An option where payment is calculated based on the difference between the strike price and the average spot price over an agreed period.
Structured contracts	OTC contracts are purely financial arrangements and are not subject to any physical constraints. As a result, they can be structured in many different ways to meet the risk management requirements of market participants. Examples of structured contracts include shaped or load following swaps or caps.

6 Generators also face a risk that their contracted hedge volumes may differ from the actual volume of electricity that they generate. Similarly, retailers also face a risk that their contracted hedge volumes may differ from the volume of electricity consumed by their customers.

Name	Description
	Under a standard swap, the parties agree on a strike price for a specified volume of electricity over a defined period. A shaped contract allows a retailer to tailor the swap so that the agreed volumes vary at different times of the day to reflect the shape of its exposure, for example the forecast customer demand. A load following swap is even more tailored to the retailer's customers' demand and will follow the actual usage of the retailer's customers over the agreed period. These types of contracts allow the retailer to manage 'volume risk' (the risk that the retailer's customers' demand is higher than the retailer expected, requiring the retailer to pay spot prices for the additional electricity to meet that demand) as well as 'price risk' (the risk that the spot price is higher than the retailer expected).

2.3.2 Exchange-traded futures and options

The ASX operates the ASX 24 platform, which allows generators, retailers or other financial market participants to trade electricity futures or options.

Box 2.2: Overview of ASX futures and options trading

The following electricity derivatives are currently traded on the ASX:

- *Futures*: Allow a generator or retailer to manage spot price volatility in a similar manner to an OTC swap. Three types can currently be traded:
  - Base load futures, which cover a full 24 hour period on each day over a specified calendar quarter.
  - Peak load futures, which only cover the period from 7:00am to 10:00pm on working weekdays in a quarter.
  - *$300 cap futures*: Allow a retailer to manage the risk of high spot prices in a similar manner to an OTC cap with a strike price of $300/MWh.
- *Options*: Allow a generator or retailer to manage spot price volatility in a similar manner to an OTC option. An ASX 24 option gives the buyer of the option the right to buy or sell an ASX 24 future at an agreed price any time before an agreed future date. Different types of options are traded - options relating to base or peak load futures, and call options (a right to buy futures) and put options (a right to sell futures).

Generators and retailers make trades on the ASX through a bank or other intermediary who is a member of the exchange, and often also use the assistance of a broker. That intermediary buys or sells futures or options that are listed on the ASX on behalf of the generator or retailer.

As a result, when generators and retailers buy and sell futures and options on the ASX, there is no direct financial relationship between them. Instead, each of them

has a financial relationship with their bank or other intermediary, and that intermediary is a member of the ASX.

This means that, for example, a generator that sells a futures product is not exposed to the credit risk that it will not receive payments if a retailer becomes insolvent. Instead, that risk is transferred to the intermediary and the ASX. The generator's only risk is that the intermediary and ASX will be unable to make payments to the generator. If the retailer fails to pay its intermediary, the intermediary is still liable to the ASX. If the intermediary fails to pay the ASX, the ASX is still liable to the generator's intermediary, who will forward that payment to the generator.

The ASX manages this credit risk by requiring anyone that trades on the ASX 24 to provide a specified amount of money as an 'initial margin', to act as credit support in the event of a failure to pay. The ASX also calculates 'variation margins' based on daily price movements. A party that purchases futures or options will be required to pay these variation margins each day, or entitled to receive a variation margin payment, depending on daily price changes.

The ASX margin payments process reduces the ASX and intermediaries' credit risk. That in turn reduces the credit risks faced by generators and retailers that trade in these products - instead of facing a risk that the OTC contract counterparty may not make payments under the contract, it faces a risk that its intermediary or the ASX may not pay, but the margining process reduces the amount of outstanding payments and reduces the risk that the intermediary and ASX will be unable to meet their obligations.

However, these margining requirements increase credit collateral or liquidity requirements for generators and retailers because they bear the risk that they will be required to pay a large amount of money within a short period of time to meet margin payments.

For example, if a generator sells futures (to protect it against low future spot prices) and the futures price increases significantly, the generator will have to make significant daily margin payments. Under an OTC contract, payments occur on the same day as spot market payments so the generator would receive high spot market revenue to offset its OTC contract payments. However, under ASX 24 futures, the generator will be required to make daily margin payments before it receives the off-setting spot market revenue, exposing it to a requirement to meet significant margin payments within a very short timeframe.

OTC contracts therefore involve higher credit risks for market participants, but exchange-traded contracts involve risks that may arise for an individual market participant due to liquidity requirements.

These credit risk and liquidity differences between OTC contracts and ASX 24 futures and options are important for our analysis of financial interdependencies in this advice.

2.3.3 Other relevant financial relationships

Generators and retailers also have financial relationships with other market participants and institutions. The most relevant relationships for the purposes of our advice are:

- As noted in section 2.1, retailers purchase electricity from the spot market and pay AEMO for those purchases. AEMO in turn pays generators for electricity that they sell on the spot market. The National Electricity Rules (NER) contain a regime that is designed to protect generators in the NEM against a settlement short-fall arising from non-payment by retailers, including requirements that retailers provide bank guarantees or other forms of credit support to AEMO to cover their spot market purchases. This regime is explained in chapter 5.

- Retailers must pay charges to distribution network service providers (DNSPs) for carrying their electricity to consumers. To protect DNSPs against the risk of non-payment by retailers, DNSPs are also able to require retailers to provide credit support. These credit support requirements are discussed in chapter 5.

There are other important relationships not shown in Figure 2.1 that can influence the financial resilience of NEM participants. In particular, generators purchase fuel such as gas or coal from commodity markets to run their generating units. These commodity markets can also be subject to volatility, and generators may enter into long-term contractual relationships with fuel suppliers. As a result, events that cause volatility in these markets could also have an impact on NEM participants, and vice versa.

2.4 An example of how a typical retailer may use hedge products

Most generators and retailers adopt sophisticated hedging strategies to manage their exposure to spot prices by using a variety of hedge products.

An example of how a typical retailer may use OTC contracts and other products to manage spot price volatility is set out below. The diagrams below show the process that a retailer may go through to build up a hedge portfolio to manage its forecast customer demand.

Figure 2.2 shows a standard load profile of average daily load for quarter 1 (January to March) by day type for a hypothetical retailer.[7]

These average load profiles can be broken into two components, the peak period and the flat period. The retailer's demand in each of these periods can be hedged using an OTC swap. This is illustrated below in figure 2.2. The retailer could also use ASX base load futures and peak load futures to achieve a similar result.

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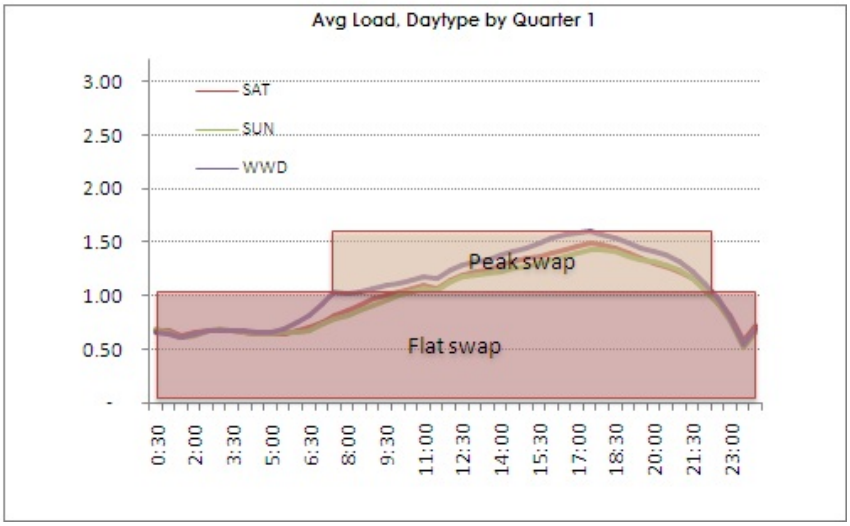
7 Load varies noticeably by the type of day. The load in this diagram ranges from the value of 1, being the average energy usage over the course of any given day, with separate measures by working week day ('WWD'), Saturdays and Sundays.

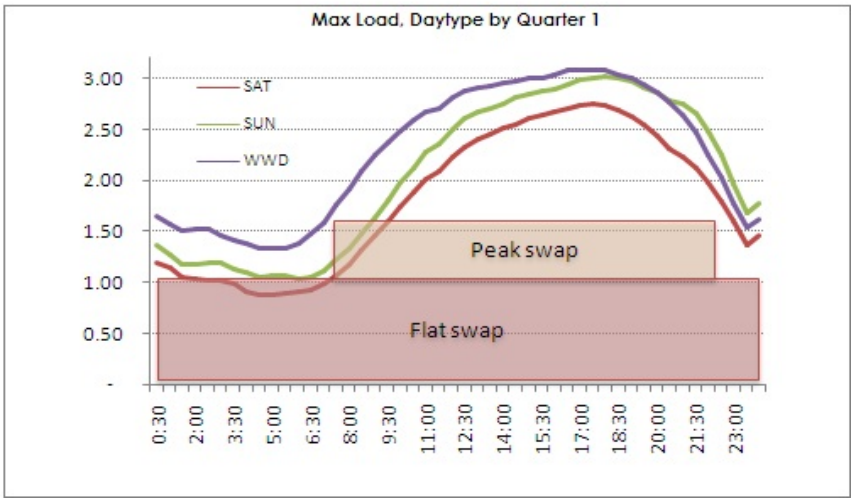
Figure 2.2 Swap coverage for retailer's average load



However, this figure illustrates that using standard sized swaps results in significant 'overs' and can also produce 'unders', ie periods of over-hedging where the hedge cover exceeds expected demand or under-hedging where the retailer has less hedge cover than necessary to cover actual demand.

These standard products also do not capture the 'flex' period - the period where load reaches maximum demand. Expected maximum load for quarter 1 is illustrated in figure 2.3 below. It is important that retailers are covered for the financial exposure of maximum load days as not doing so could result in extremely high spot market liabilities that the retailer is unable to meet.

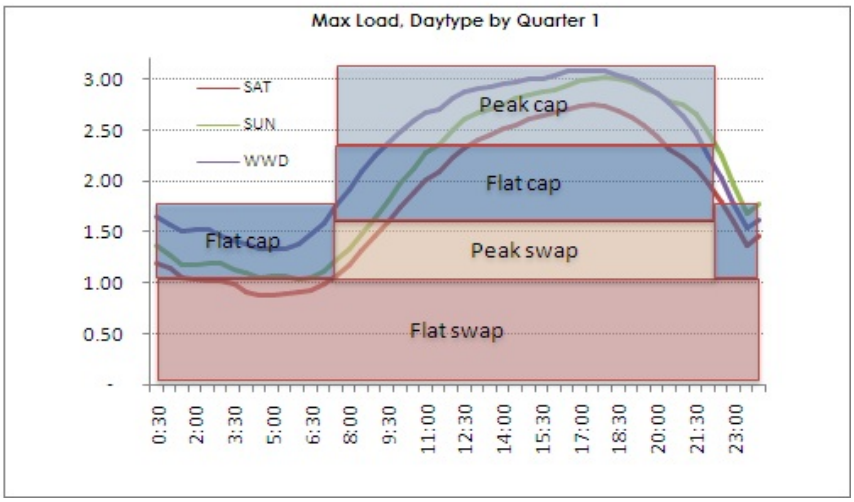
Figure 2.3 Retailer's maximum load



As can be seen from figures 2.2 and 2.3, the variation between forecast maximum demand and forecast average demand is significant on a maximum load day (for example, a very hot working weekday). On these days, both the peak swap and the flat swap would not provide sufficient cover against the risk of high spot prices.

Standard hedging practice for retailers is to cover the flex period with caps, as illustrated in figure 2.4 below. These caps could be OTC cap contracts or ASX $300 cap futures.

Figure 2.4 Cap contract coverage for retailer's maximum load



As an alternative to caps, a vertically integrated operator that also owns generation assets may use peaking generation to provide cover for its maximum demand in a similar way to a cap contract.

Major retailers also often have an additional layer of insurance that overlays the peak cap given that they are unable to forecast their customers' actual demand load with certainty. This insurance is generally based on the occurrence of other conditions, like weather outcomes (for example, the number of days above certain temperature) or the failure of a generating unit in the case of a vertically integrated operator.

This example shows that adequate hedge cover requires the purchase of a variety of products. Given that a retailer's demand will vary across quarters and NEM regions, these diagrams also illustrate the contractual complexity that needs to be managed by a retailer and the range of financial relationships that it is likely to need to enter into with other market participants.

3 Key concepts and objectives

In this chapter, we define some important initial concepts that relate to the objectives of this project.

Box 3.1: Objectives of this project

This advice will consider the nature of risks to the NEM arising from financial interdependencies between market participants. In particular, we will consider whether the financial markets that underpin the efficient operation of the NEM are sufficiently resilient to withstand an unexpected or unusual event or series of events that could cause one participant's financial distress to be transmitted to other participants, causing financial contagion which may damage the achievement of the NEO.

We will then consider, together with market participants, whether there is a need for further mechanisms to mitigate those risks.

3.1 The National Electricity Objective

The National Electricity Objective (NEO) is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- price, quality, safety, reliability and security of supply of electricity; and
- the reliability, safety and security of the national electricity system.[8]

3.2 Financial interdependency in the NEM

The previous chapter outlined the types of financial connections that can exist between market participants in the NEM.

We define 'financial interdependency' as the degree to which the financial connections between one or more participants can act to transmit financial distress from one party to another.

If a participant is said to have a high level of interdependency with another party, we mean that its ongoing commercial viability during some form of unexpected or unusual event or chain of events is substantially dependent on the continuing commercial viability of that other party.

For example, a retailer which had a significant proportion of its customer demand hedged under OTC contracts with a single generator could be said to have a high

8 National Electricity Law, section 7.

interdependency with that generator (as we explore in chapter 5). However, if that retailer had spread its hedge portfolio amongst several counterparties and ASX futures, the interdependency – ie the link between the generator's ongoing viability and the retailer's ongoing viability during a financial shock - would be substantially reduced.

Box 3.2: This advice is primarily concerned with unexpected or unusual events

As noted in chapter 1, the financial markets that underpin the operation of the NEM are considered to be reasonably robust. However, this advice will consider their ability to withstand an unexpected and unusual event or series of events.

We do not seek to define an exhaustive list of applicable events in this paper. The global history of electricity markets and financial markets more generally contains an array of relevant examples that have led to significant financial failures, including prolonged drought, sustained power system failure or corporate fraud. However, the majority of those events only affected a small number of participants and did not lead to widespread financial contagion. In most cases, it is a series of related events that has led to significant financial problems, rather than one isolated event.

The examples below did not always lead to significant financial contagion in their respective markets, but are examples of the types of significant financial failures that had the potential to lead to significant financial contagion if not properly managed. Among other issues, this project will consider how well the NEM would manage events of this nature if they occurred in Australia.

The Commission notes that the design and operation of electricity markets in both California and Europe differ to the NEM. Therefore, the key issues from the following examples should be considered accordingly.

California energy crisis of 2000/01

California is an important case study because of the sheer magnitude of the collapse and the unique characteristics that led to what became known as the Californian energy crisis.

Full retail contestability was introduced in California in March 1998. In the summer of 2000, the market experienced a substantial increase in the wholesale cost of electricity, with the spot price rising from about $30/MWh in 1999 to over $300/MWh by the end of 2000. The existence of the regulated retail price caps prevented the two large investor-owned utilities, Southern California Edison (SCalEd) and Pacific Gas & Electric (PG&E) from passing on the high wholesale electricity costs and other increased costs to consumers. Regulations also significantly restricted SCalEd and PG&E's ability to enter into long-term forward contracts, which left them highly exposed to spot price movements. Exposed to the sustained high spot price with insufficient hedging cover, SCalEd and PG&E were both technically insolvent by the end of January 2001.

With the insolvency of these two utilities and financial difficulties faced by other participants, independent generators refused to produce power.[9] In the event, shutdowns increased from an historical average of 2,500MW to about 10,000MW.

Consequently, between January and May of 2001, the State of California was forced into the position of becoming the central buyer of electricity, and purchased $8 billion in forward contracts. If the government had not taken these steps, the crisis potentially could have led to more widespread financial contagion and damaged the long-term efficient operation of the market.

TXU Europe and British Energy

In 2002, a number of large UK energy companies faced financial distress and in some cases insolvency following a prolonged period of low wholesale electricity prices, in part, driven by excess capacity and the introduction of new electricity trading arrangements. Over time, the fall in prices led to large losses for a number of participants who had contracted to purchase energy at prices higher than could be passed on to customers.

During this period, a number of high profile energy companies including British Energy (which owned and operated a number of large nuclear power stations) and TXU Europe (a vertically integrated operator with a large number of customers and a subsidiary of the broader United States power group TXU) experienced financial difficulty.

In the case of British Energy, the financial difficulties facing the entity required a substantial bail out from the UK Government to avoid insolvency.

In the case of TXU Europe, the difficulties faced in the UK market were exacerbated by financial concerns about its US parent company. In October 2002, the withdrawal of financial support from TXU Europe's parent company cast TXU Group entities into crisis. Management attempted to complete a financial restructuring, including the sale of part of its UK operations to Powergen PLC, a unit of the German utility, E.On AG. Assets sold included its 5.3 million gas and electric customers and three power plants.

The restructuring failed and TXU Europe entered into administration in November 2002. This voided a large number of TXU Europe's contracts with other energy companies in the UK (mainly generators).

The administration of TXU Europe caused broader contagion across the UK energy market. A number of counterparties to TXU Europe, including Scottish and Southern Energy, International Power and Drax, suffered large financial losses. In the case of Drax (which was at the time owned by American company

9 As is the case with AEMO in the NEM, the Californian System Operator/Power Exchange did not underwrite counterparty credit.

AES Corporation), the default of TXU Europe caused Drax to default on its debt obligations (Drax had approximately 60 per cent of its output contracted with TXU Europe at the time of its failure). This caused AES to abandon its investment in the Drax power plant in August 2003 with the power plant subsequently operated by creditors until 2005.

Energy security in the UK was not compromised during this period owing to the overcapacity in the UK market. However, the number of affected participants demonstrates the possible systemic implications that could have arisen in different circumstances.

3.3 Financial Contagion

Financial contagion occurs when the interdependency between market participants acts to transmit the financial effects of an event from one party to another.

The global financial crisis is a recent example of the emergence of contagion between participants in financial markets. The collapse of one entity caused the collapse of, or placed severe stress on, other entities by virtue of contractual or structural interdependencies.

In a market with extensive interdependencies, the contagion could emerge as a 'cascading' effect as participants progressively encounter financial difficulties and potentially even collapse in response to the financial difficulties of their counterparties.

3.4 The effect of contagion on the achievement of the NEO

As with all of the AEMC's work, the NEO will guide our advice. As stated earlier, the objective of this advice is to identify the degree to which the emergence of financial contagion could hinder the achievement of the NEO.

The financial failure of businesses is not necessarily indicative of economic inefficiency in the market's design or function. Business failure is a natural part of any market.

The isolated failure of one business also will not necessarily hinder the achievement of the NEO. Indeed, it may lead to opportunities for new, more efficient, businesses to enter the market.

Accordingly, this advice is not concerned with preventing an individual business failing due to its own business decisions. As noted in SCER's request for advice, individual market participants need to manage their own commercial and business decisions.

However, the emergence of financial contagion could hinder the achievement of the NEO.

The results of financial contagion might include intrusive regulatory intervention in markets, reduced competition, a reduction in investor confidence or threats to the

security of electricity supply. Even if electricity continues to be supplied to consumers, consumers risk facing higher prices and less reliable supply if investment is deterred. These risks are likely to be particularly pronounced if investors consider that regulatory arrangements contributed to the financial contagion and that it could be repeated in future.

The effects of contagion can also erode confidence in the market structure and make consumers, governments and their agencies more risk averse. For example, these types of impacts were experienced by financial markets during the global financial crisis. These effects can threaten the ongoing efficiency of the market itself and may substantially damage the long term interests of consumers.

4 Existing contagion-mitigating mechanisms and practices in the NEM

The NEM is a mature market with a diverse array of experienced utilities operating in generation and retail markets. For these participants, managing risk is an integral part of their business. Risk management helps decision makers to make informed decisions, prioritise actions and distinguish between alternatives.

Prudent energy businesses have corporate governance frameworks and risk management strategies, policies and procedures that define risk tolerances and set due diligence to promote reliable and efficient decision-making. The directors of businesses also implement 'enterprise risk management' arrangements that are designed to identify potential events that may affect the business and manage risks within the business' risk appetite.

There are also a number of existing regulatory mechanisms that seek to ensure prudent risk-taking.

These existing risk management practices of prudent generators and retailers and existing regulatory requirements provide a framework that should mitigate the risk of financial contagion in many circumstances.

4.1 Defining risk

Energy companies manage a portfolio of risks. Determining how to allocate and manage those risks is at the base of most business decisions. While companies are likely to classify risks differently, the risks listed below provide an overview of the spectrum of risk that an energy company needs to manage:

- *Market risk:* the risk that the value of an overall market or asset class will change according to economic conditions or other factors. Sub-categories include: commodity; equity; interest rate; liquidity; and currency risk.

- *Operational risk:* the risk of loss from inadequate or failed internal processes, people and systems, whether driven by internal or external factors. Sub-categories include: strategic risk; hazards; generation operations; energy trading operations; people; customer service; information systems; supply chain; project management and delivery; business continuity; legal; reputational; regulatory and policy; and internal conduct (eg codes of conduct); compliance

- *Credit risk:* the risk that a debt issuer may default on payments. This risk can also be called counterparty risk.

Credit risk is the most relevant risk from the perspective of managing financial contagion. Liquidity risk is also relevant and may increase during the types of events that can lead to financial contagion.

The following sections explain the different ways that businesses manage risks, particularly credit risk.

4.2 Internal risk management measures taken by participants

Corporate governance - structure

Businesses have corporate governance frameworks that set the policies and processes for assessing the impact of risk, determining the overall risk appetite of the business and implementing appropriate risk management procedures and controls. This includes monitoring and reporting.

The key elements to a standard governance structure include:

- A board-level risk committee. The board tends to define the company's risk appetite, determine its allocation across different risk categories and set the respective limits.
- Targeted risk committees. These risk committees oversee, manage and report compliance with risk policies and limits for each of the key risk areas (operations, market and credit).
- Internal audit programs. Internal audit assesses and reports on adherence to risk and assurance policies.
- External audit programs. An external audit is likely to cover many of the financial reporting elements as well as commodity trading functions.

Corporate governance – policies and directives

Committee directives and risk policies can define staff roles, responsibilities and accountabilities. Policies may impose boundaries like specifying that there are separate teams which strike and then confirm trades. They also detail regular monitoring and reporting requirements and, when required, escalation processes; for example, to manage cases where risk limits are breached.

Training is a key element of any risk management framework. Businesses will generally have training programs that cover both the requirements of internal policies as well as compliance with external regulations. Regular refresher training is usually a part of the training plan and, in some cases is a regulatory requirement.[10]

Risk and compliance policies are often informed by the benchmark standards, like those published by the International Organization for Standardization (ISO).[11]

10 Annual training is a condition of an Australian Financial Services (AFS) licence.

11 Relevant guidelines include: ISO 31000:2009 Risk management – principles and guidelines; and ISO Guide 73:2009 Risk Management – Vocabulary. Available: http://www.iso.org/iso/pressrelease.htm?refid=Ref1266.

4.3 External risk management requirements

ASX Corporate Governance Council Principles and Recommendations

Listed companies have ASX requirements that they must comply with. The ASX Corporate Governance Council Principles and Recommendations[12] set out a series of recommendations relating to establishing a system of risk oversight and management, and internal control.

Australian Financial Services Licence requirements

The *Corporations Act 2001 (Cth)* requires entities dealing in OTC electricity derivatives to hold an Australian Financial Services (AFS) licence.

As an AFS license holder, energy businesses are required to comply with specified financial capacity measures and to have in place systems to manage these capacity requirements.

ASIC assesses applications for AFS licences as part of its role as regulator of the financial services industry. When assessing a licence application, ASIC considers whether the applicant:

- is competent to carry on the kind of financial services business specified in the application;
- has sufficient financial resources to carry on the proposed business — unless regulated by the Australian Prudential Regulation Authority (APRA); and
- can meet the other obligations of an AFS licensee.

Additional standards and requirements relate to training, compliance, insurance and dispute resolution.

ASIC's Regulatory Guide 166 sets out the financial requirements that a business needs to meet as a holder of an AFS licence.[13] Table 4.1 summarises some of the key requirements for energy businesses.

12 http://www.asx.com.au/governance/corporate-governance.htm.

13 ASIC, *Regulatory Guide 166: Licensing: Financial Requirements*, May 2010. Available: www.asic.gov.au/asic/pdflib.nsf/LookupByFileName/RG166a.pdf/$file/RG166a.pdf.

Table 4.1 Summary of key ASIC RG166: Licensing: Financial Requirements[14]

Section	Who is covered	Summary of ASIC policy requirements
A: General policy on financial requirements	All licensees, except licensees regulated by APRA	Risk management systems must address risk to financial resources
B: Base level financial requirements	All licensees, except licensees regulated by APRA and certain market and clearing participants that are subject to other requirements instead	Positive net assets and solvent Sufficient cash resources to cover next three months' expenses with adequate cover for contingences Audit compliance annually and when ASIC asks
F: Licensees with financial obligations from transacting with clients as principal	Licensees owing liabilities or contingent liabilities by entering into transactions with clients	Tiered adjusted surplus liquid funds (ASLF) requirement from $50,000 to $100 million ASLF calculation contains adjustments for assets and contingent liabilities Requirement for board consideration when trigger points are reached

ASIC is required to issue an AFS licence to all applicants unless ASIC can demonstrate good reason for refusing the licence. For example, a licence could be refused only if ASIC believed the applicant would not comply with its obligations if it were granted a licence.

ASIC is currently undertaking a review of the financial requirements applying to electricity derivative market participants that hold AFS licences.[15]

ASIC is proposing a number of amendments to current financial obligations on electricity market participants that hold AFS licences. The proposals discussed in the consultation paper include requiring market participants to:

- prepare rolling cash flow projections, make the cash flow projections available to ASIC on request and have the cash flow projections approved by the participant's directors;

14 ASIC, *Regulatory Guide 166: Licensing: Financial Requirements*, May 2010, pp 6-7.

15 ASIC, *Consultation Paper 177: Electricity derivative market participants: financial requirements*, May 2012. Available at http://www.asic.gov.au/asic/asic.nsf/byHeadline/12-86MR%20ASIC%20consults%20on%20revised%20financial%20requirements%20for%20electricity%20derivative%20issuers?opendocument.

- hold net tangible assets equal to the greater of:
  - $150,000; or
  - 10 per cent of the participant's average revenue;
- hold at least 50 per cent of the required net tangible assets in cash or cash equivalents, and hold the remainder in liquid assets; and
- report its net tangible asset position to ASIC as part of its license obligations.

ASIC notes that it is not a prudential regulator and its requirements are not intended to ensure that licensees meet financial commitments to counterparties. The objective of the proposed reforms is to promote the orderly operation of the electricity OTC derivative markets.

Potential future reforms currently being considered by Treasury

The Commonwealth Treasury has recently published a consultation paper on options for reforms to over-the-counter contracts.[16] The proposed reforms do not refer specifically to electricity OTC contracts, but appear to be of broad application and could apply to all OTC contracts.

Following the global financial crisis, the Australian Government and other members of the G20 committed to reforms in OTC derivatives markets. The consultation paper sets out options for a legislative framework to implement those commitments. This paper follows a report by the Council of Financial Regulators on this issue. Treasury is currently seeking comments on the proposals in the consultation paper.

The proposed legislative framework would allow the Minister for Financial Services and Superannuation to require certain classes of derivatives to be subject to one or more of the following new obligations:

- Report trades to an eligible trade repository. Trade repositories maintain centralised records of transaction data. Treasury considers that centralising the collection, storage and dissemination of this data can play an important role in providing information that supports risk reduction and increases transparency.
- Clear trades through eligible central counterparty. Central counterparties provide clearing services for derivatives. The use of central clearing can mitigate counterparty credit risk by transferring that risk to the central counterparty who would then implement mechanisms to manage this risk (such as the margining process currently applied by the ASX for exchange traded electricity futures and options).

16 The Treasury, *Implementation of a framework for Australia's G20 over-the-counter derivatives commitments, Consultation Paper*, April 2012. Available at: http://www.treasury.gov.au/ConsultationsandReviews/Submissions/2012/Over-the-counter-derivatives-commitments-consultation-paper.

- Execute trades on eligible trading platforms. This obligation would require parties to execute their derivatives trades through an exchange or electronic trading platform, such as the ASX.

It is currently uncertain whether any or all of these obligations would apply to electricity OTC contracts. The consultation paper also notes that it may be more appropriate to allow time for industry-led solutions to be developed in some of these areas before imposing regulatory obligations. If industry-led solutions or new regulatory requirements were implemented, they would have implications for our advice.

The Council of Financial Regulators is also currently conducting a separate review in relation to financial market infrastructure at the request of the Treasurer.[17] A working group has been established and is considering issues including the adequacy of oversight, powers of direction and crisis management arrangements for market operators and clearing and settlement facilities. Any reforms arising from the Council's work may be relevant for our advice.

4.4 Managing credit risk

Managing credit risk and limiting exposure to individual counterparties are important for minimising the risk of financial contagion. As discussed in Chapter 2, generators and retailers trade with each other to manage market risk. Credit limits and trading guidelines set parameters around how much exposure a business can have to a single counterparty. For OTC trades, individual businesses set the risk thresholds and guarantee requirements while clearing houses set those parameters for exchange-based trades.

Over-the-Counter (OTC) trading

When executing an OTC trade, the individual counterparties take on the risk of default. Each NEM participant has well-developed credit assessment and review policies and procedures that set credit requirements and parameters around what level of exposure is appropriate to each counterparty within the context of board-approved risk limits. A prospective counterparty's risk level can depend on a number of factors, including, but not limited to, its company credit ratings, company history generally, financial solvency, company experience in the market, and previous trading experience.

For more risky counterparties, a business may require credit support as a condition of trade. Examples of credit support include bank guarantees, parent company guarantees or margining. This helps manage the risk of default. As each company sets its own risk tolerances and limits, conditions of trade can vary between participants.

17 See http://www.treasury.gov.au/ConsultationsandReviews/Submissions/2012/Council-of-Financial-Regulators-Financial-Market-Infrastructure-Regulation.

Exchange-based trading

To access exchange traded futures and options, a NEM participant will usually contract with an intermediary ('clearer') who is a member of the exchange, typically a bank or other financial intermediary. This design means the clearer takes on the liability and manages the consequences of counterparty default rather than the individual counterparties. The exchange is therefore exposed to the credit risk of the clearer.

To manage its risk, the clearer assesses the credit risk of each individual participant and assigns a credit obligation commensurate to the perceived level of counterparty risk. The credit provided to the clearing house is to assure that the clearer has access to sufficient funds to close out all trades in the event of client default and meet all margins that need to be paid to the exchange. Credit can take the forms of an upfront cash pool, a letter of credit or bank guarantee in excess of the expected range of trades for the participant.

This structure is designed to reduce the risk of a shortfall in the event of a default, and mitigates the exposure of trading counterparties to a defaulting participant.

Credit assessments and obligations are client specific. Assessments are made using a variety of factors which will shift expectations and assessment outcomes over time. Similar to assessments that OTC counterparties undertake, a broker considers a range of factors to determine a client's credit limit, including:

- income - actual and expected;
- risk profile – financial and legal information;
- company credit ratings;
- company history generally;
- company experience in the market;
- company structure;
- audited accounts;
- bank guarantee availability;
- bank that is being used;
- parent company, structure and assets;
- past history of positions held (if any and if not will be an issue);
- projected trades volumes;
- company's intentions / projected positions, possibly requiring explanation as to how future margin requirements are to be funded internally (eg terms of any loans); and

- market factors, credit environment, market volatility, and other relevant circumstances.

The ASX also undertakes credit assessments of clearers and performs stress testing of clearers. The ASX has also established a Clearing Guarantee Fund for use in the event of default by a clearer.

4.5 Implications for managing financial contagion

It is instructive to examine how appropriate risk management practices may mitigate the risk of financial contagion.

The application of credit limits means that counterparties tend to limit their exposure to a default by a counterparty of low credit worthiness, by limiting the amount of hedges in place and/or securing credit support arrangements to account for any potential failure.

Financial contagion requires that the default of one market participant has a significant impact on other participants such that subsequent default occurs. If no single counterparty has a large exposure to any other counterparty, then financial contagion is far less likely to be a market-wide issue, in that a default would not cascade to default in other counterparties (although it will still be an issue for the participants that are not paid due to the default).

In the energy sector, all prudent participants involved in the use of financial derivatives should ensure that robust arrangements are in place to mitigate credit risk, For example, with OTC contracts, parties to the contract may require bank guarantees as credit support. Clearing houses require significant margins supported by bank guarantees for exchange traded futures contracts on behalf of participants. Some participants may be unable to, or may decide not to, engage in futures trading given the potentially significant requirement to meet margin call payments.

Likewise, where market participants are exposed to each other credit risk and trade directly, for instance through the use of OTCs, parties limit the amount of contracts exchanged and the duration of those contracts. For example, a generator may have in place varying contracts of quarterly and annual duration with a range of retailers. These steps are intended to reduce the risk that any one counterparty's failure will significantly impede the ongoing viability of the generator's business.

In this manner, market participants continually adjust and monitor their risk exposures as their contract position and credit exposures evolve.

5 Potential financial contagion risks

This chapter explores the potential for financial interdependency in the NEM to result in financial contagion in the event of a major unexpected event or series of events.

It does so by discussing our initial analysis of two examples of the types of events that could potentially lead to significant financial contagion, if not mitigated by the mechanisms discussed in chapter 4.

As noted previously, the Commission's initial view is that financial relationships and markets that underpin the efficient operation of the NEM are generally robust, which means that there is likely to be a low probability of financial contagion occurring in the NEM. However, the aim of this advice is to consider the nature of risks to the NEM arising from financial interdependencies and the potential impact on electricity financial markets. To that end, the examples below illustrate some events that could give rise to financial contagion.

The first example is the potential effect on market participants of a major generation or transmission outage.

The impacts of the insolvency of a large retailer are then considered. That insolvency could arise from the contagion caused by the initial generation or transmission outage or from independent causes.

This chapter also considers the implications of the retailer of last resort (ROLR) scheme on the potential for financial contagion in the event of the insolvency of a large retailer.

Market participants are generally aware of these risks and seek to mitigate them by adopting risk management strategies of the nature discussed in chapter 4.

5.1 The role of high spot prices

In electricity markets around the world, it has historically been the case that circumstances that threaten the collapse of utility companies have generally arisen during periods of extremely high spot prices. This phenomenon is perhaps not surprising, but it is an important observation with regard to the context of this project.

For example, high spot prices tend to put direct pressure on parties that have sold contracts, be they OTC contracts, exchange-traded hedges or customer contracts. When a party to a contract faces a large payment and is unable to properly offset that payment with income from a balancing or hedging instrument or other source, the result can cause serious financial difficulties for that party.

High spot prices also tend to lead to increases in forward market prices, which also increase credit exposures between participants and credit support requirements. This may restrict the ability of participants to hedge positions. All of these effects can compound the financial distress of participants and increase the risk of contagion.

A historical example is the Californian energy crisis of 2000/2001 that was discussed in chapter 3. Sustained periods of very high spot prices combined with a series of other events to significantly increase the costs faced by retailers in the summer of 2000. The existence of regulated retail price caps prevented the two large investor-owned utilities from passing on the high wholesale electricity costs to consumers, and these utilities became insolvent and collapsed about six months later, resulting in market intervention by authorities.

Although it is possible for businesses to collapse in the absence of high spot prices, the risks of such a failure causing financial contagion are likely to be most severe during a period of high prices. Accordingly, this chapter considers events that occur during times of unusually high spot prices in the NEM.

Box 5.1: The administered price cap mechanism

The design of the NEM includes administered pricing provisions that act to cap spot prices during extreme market conditions. If the sum of the spot price for the previous 336 trading intervals exceeds the cumulative price threshold of $187,500, the administered price cap provisions activate and cap the spot price to $300/MWh until the next trading day where the rolling summation of prices (calculated as though the price cap was absent) no longer exceeds the threshold.[18]

While this mechanism acts as a boundary to the amount of debt a market participant can accrue over a short time period and may limit financial contagion in some circumstances, that boundary is still orders of magnitude higher than the debts that would apply under normal market conditions and a retailer could still incur very large spot market liabilities. It could also be exposed to increased credit collateral requirements. As such we consider that the mechanism reduces the risk of contagion, but may not necessarily act to prevent contagion following an unexpected or unusual event.

5.2 Potential contagion from a generator to a retailer

Our analysis of examples of scenarios that could potentially lead to financial contagion starts by considering the potential impacts of the failure of a large generator.[19] Our initial analysis, which is summarised in this chapter, indicates that there is a risk that such a failure could lead to contagion that causes the failure of one or more large retailers in certain circumstances.

18 The cumulative price threshold is indexed annually and will increase to $193,900 on 1 July 2012.

19 The term 'generator' is used in this paper to refer to a business that has significant electrical power generating assets and is participant in the NEM. The term 'generating units' refers to those physical assets the company owns that generate electricity. One large power station may be comprised of several independent generating units.

This generator failure could be triggered by a range of circumstances, including sustained periods of depressed prices, a sustained outage of the generator's generating units, a sustained transmission outage that prevents the generator from selling its output, or a disruption to fuel supplies.

Generator outage

In certain circumstances, a generation outage could expose the generator and retailers with which it has entered into contracts to significant financial risks. The nature and extent of the risks to retailers may depend in part on whether the generator has contracted through OTC contracts, exchange traded contracts or is part of a vertically integrated business. These risks are most likely to arise if:

- the power station is large;
- the outage affects all generating units of the power station simultaneously;
- the outage lasts for a significant period (i.e. several days or more);
- the generating units are part of a vertically integrated business and are critical for supporting the retail load of the business;
- the generator has a high level of hedge contracts that are concentrated with relatively few market participants; and
- the outage occurs during a period of high demand or when the output of other power stations is also constrained.

A significant generation outage could result in:

- a reduction in liquidity in the contract market;
- the generator incurring significant liabilities under its hedge arrangements, which would not be offset by spot market revenue as would have been the case in the absence of the outage;
- significantly increased spot prices during the period of the outage, which exacerbate these hedge exposures; and
- the generator incurring large variation margin payment obligations in relation to any ASX 24 futures and options hedge positions due to the increase in spot prices, with those margin payments needing to be made the next day.

Some OTC hedge contracts contain force majeure clauses that would allow the generator to reduce its obligations under the contract in the event of an outage that was beyond its reasonable control, although we understand that the existence and content of clauses of this nature vary. If the generator's contracts contained such a clause, retailers that are counterparties to the hedge contracts could be exposed to potentially high energy costs stemming from the spot price, depending on the terms of the force majeure clause.

The generator would normally seek to insure against this risk by obtaining business interruption insurance. However, we understand that insurance against the risk of a generating unit outage is normally subject to a material time-related deductible and so may be of limited use in these circumstances.

If the generator is not able to meet its liabilities under its OTC contracts and ASX futures and options, the generator's directors or creditors may elect to place the generator into insolvency.

These events could also lead to the generator breaching its debt covenants or the conditions of its Australian financial services licence due to the reduction in its revenues and increase in its hedge liabilities.[20]

Debt covenants are conditions of borrowing agreed between a lender and a borrower. These covenants are used primarily to address the mismatch between the risk-reward profiles of equity-holders and debt-holders, by forcing the company to maintain a level of financial health that will reduce the risk of insolvency.

The measures used within covenants vary, but some common measures include:

- maximum gearing ratio: this is the percentage of the company that can be effectively financed with debt;
- minimum debt service cover ratio: this is the level of available cash flow relative to scheduled interest and principal payments; and
- minimum loan life coverage ratio: this is the net present value of the asset's future cash flows relative to total debt outstanding.

A breach of the company's debt covenants would usually theoretically allow debt providers to demand immediate repayment of the debt. If the generator could not meet this demand (as may be likely), the debt providers would in theory usually be entitled to take control of the generator's assets. However, debt providers tend not to take these measures without first exploring with the company debt restructuring possibilities and options for the provision of additional equity.

Whether the directors or creditors would elect to place the generator into insolvency or take significant action in relation to a breach of debt covenants will depend on the circumstances. The generator's creditors will act in their own financial interests and are likely to be reluctant to take action that will result in the generator ceasing to operate (and therefore produce future revenue that can be used to pay debts). However, as explained below, the insolvency of a generator may not result in it ceasing to operate, at least in the short term.

In addition, it is likely to take some time for creditors to assess the state of the generator's finances and decide on the most appropriate course of action. If the

20 Australian financial services licence conditions are discussed in chapter 4.

generation outage only lasts for a few days, the generating units may be operational again before the creditors have made a decision to place the generator into insolvency. If the generating units are operational again, the generator will begin generating revenue and the creditors may consider that this revenue will be sufficient to recover the generator's losses over time and therefore decide against insolvency.

However, if a large generator suffered an outage of all of its generating units that lasted for several days during a period of high demand and therefore high spot prices, it could incur hedge contract liabilities exceeding $100 million. In those circumstances, the directors may have no option but to place the company into insolvency so as to avoid breaching their duties by trading while insolvent.

Implications of a generator insolvency

There are several types of insolvency proceedings that have different implications for the analysis of financial contagion. We note that a generator in financial difficulty may also avoid insolvency action through a negotiated sale of assets or a range of other mechanisms.

If the directors or creditors of the generator were to obtain a court order for it to be wound up, the liquidator of the company may disclaim certain contracts and it is possible that the generator will not pay out under its hedge contracts.

If a generator became insolvent and a receiver or administrator was appointed instead of immediately seeking to wind up the company, the company may continue to operate as a going concern while it is in receivership or administration.

However, a receiver is not normally liable for contracts entered into by the company prior to the receivership and may repudiate those contracts, even though the company is continuing to trade. Repudiation would make the company liable for damages for breach of the contract, but liability for those damages is likely to rank in priority behind secured creditors. Accordingly, if a secured creditor appointed a receiver and the receiver repudiated some or all of the generator's hedge contracts, the claims of retailers that were counterparties to those hedge contracts would rank behind the secured creditor in priority and may ultimately be worthless.

It is difficult to predict how a receiver or administrator would act, but if the generator owes significant amounts under its hedge contracts when it becomes insolvent, a likely consequence of the insolvency is that the generator will not make payments under those contracts, even if it is continuing to trade. OTC contracts are generally regulated by the terms of the ISDA Master Agreement, which contains cross-default provisions. Under those provisions, a default under a contract with one party above a specific threshold will result in other counterparties having a termination right under their OTC contracts. Accordingly, if a receiver or administrator fails to make payments under some of the generator's hedge contracts following insolvency, that breach could give other retailers the right to terminate their contracts with that generator.

If a generator was to become insolvent and default on its hedge contract obligations, retailers that were counterparties to those contracts:

- could incur significant spot market liabilities that may be effectively unhedged. Spot prices are likely to increase significantly during the period of the outage because there will be less supply than normal. If the affected generator is large and the outage occurs during a high demand period, the spot price could rise to extremely high levels.

- may need to try to obtain replacement hedge cover, which is likely to be more expensive during a period of high prices and reduced generation capacity; and

- may breach their AEMO trading limits[21] due to the increase in spot prices, which would result in AEMO requesting that the retailer provides additional credit support within a very short timeframe. Should the retailer be unable to meet this request, AEMO may issue a call notice and/or default notice requiring the retailer to post substantial additional credit support within 1-2 days or face suspension from the market.

This increased financial pressure on one or more retailers could ultimately lead to their insolvency. This would be a manifestation of 'financial contagion' as we defined it in chapter 3.

Transmission outage

A similar outcome to the generator outage scenario described above could result from a sustained network outage.

A major transmission outage could result in a significant reduction in the output of one or more generators. As above, that reduction in output would lead to reduced spot market revenues and increased hedge contract liabilities, which the generator may be unable to meet. If the outage is sufficiently large and prolonged, the flow-on effects could result in the insolvency of affected generators. The impacts on retailers would be similar to those described above, with the possibility of triggering a retailer insolvency.

5.3 Potential contagion from retailer to retailer

A large retailer failure could in turn cause other retailers to fail, furthering the progressive effect of financial contagion in the market. A retailer could of course also fail for a variety of other reasons. This advice is not primarily concerned with the underlying cause of the event, but rather with the impacts that such an event could have on other participants and ultimately the achievement of the NEO.

21 Retailers in the NEM must post credit support in the form of bank guarantees to the market operator AEMO. This mechanism is designed to offset the risk posed to AEMO by a retailer failing to pay AEMO for the energy its customers consume and is explained in section 5.3.3 below.

Prudent retailers would seek to mitigate these contagion risks through their internal risk management strategies that are discussed in chapter 4. However, during the type of unexpected and unusual event or series of events that is the focus of this paper, it may not be possible for a retailer to simultaneously satisfy all of its usual risk management requirements.

If a retailer becomes insolvent, that will trigger the operation of the retailer of last resort (ROLR) provisions. We consider that in some circumstances, the application of the ROLR provisions can increase the extent of financial interdependencies in the NEM and facilitate the spread of financial contagion.

5.3.1 Background to the retailer of last resort scheme

The ROLR scheme is principally designed to ensure that, if retailer failure occurs, arrangements are in place to ensure that customers continue to receive electricity supply and ensure that money continues to flow from customers to retailers and from retailers to generators.

ROLR provisions are currently administered by the jurisdictional regulators in each region of the NEM. Appendix A sets out two historical examples of the use of the current jurisdictional ROLR schemes.

The ROLR provisions are set to become harmonised under the introduction of the National Energy Consumer Framework (NECF) and the commencement of the National Energy Retail Law (NERL). The harmonisation will feature alignment of processes under a ROLR scheme that is administered by the Australian Energy Regulator (AER) and AEMO.

Although the ROLR provisions in the NERL share many features with previous jurisdictional retailer of last resort schemes, the NERL ROLR provisions are currently untested. Previous retailer of last resort schemes were used in response to the failure of second tier retailers, but have not been tested in relation to the failure of a large retailer.

The ROLR arrangements in the NERL are expected to commence from 1 July 2012. Our advice will be based on those ROLR provisions. [22]

Box 5.2: How does the ROLR scheme work?

The NERL contains provisions for a national ROLR scheme to provide arrangements across all NEM jurisdictions in the event of retailer failure.

A 'default ROLR' must be appointed by the AER for all electricity connection points. In practice, default ROLRs are generally the original incumbent retailers

22 We note that some jurisdictions have recently announced that the implementation of the NECF will be deferred in those jurisdiction beyond the original intended commencement date of 1 July 2012. This may require the Commission to also consider differences between the NECF ROLR provisions and the relevant jurisdictional retailer of last resort schemes.

in the region who previously acted as ROLRs under the existing jurisdictional schemes. It is possible for more than one default ROLR to be appointed in an area.

In addition, the AER may appoint one or more 'additional ROLRs' in an area. If there is a ROLR event, the AER will then be able to determine which of the default ROLR(s) or additional ROLR(s) should become the new retailer and take on the customers of the failed retailer in each area, or spread the customers between more than one retailer.

Retailers can submit an expression of interest to the AER to become an additional ROLR. The AER has developed measures to assist with the selection process for additional ROLRs. This includes establishing two categories of additional ROLR registration—a 'firm offer' category and a 'non-firm offer' category. The firm offer registration category allows retailers to pre-commit to the terms and conditions under which they would be prepared to be appointed as a ROLR. This enables the AER to have the information it needs to quickly make appointment decisions and the prior agreement of retailers to make the appointments. The non-firm offer category enables retailers to register their interest to be a ROLR, but does not commit them to acting in that role. Retailers are able to register for either or both additional ROLR categories. The AER is currently reviewing expressions of interest for registering additional ROLRs.

When a ROLR event is triggered, a default ROLR or an additional ROLR will be appointed as the 'designated ROLR' for each electricity connection point. The designated ROLRs are responsible for taking on new customers and facilitating customer transfers from the failed retailer.

The default ROLRs will be appointed as the designated ROLR unless the AER provides AEMO with written notice appointing another retailer instead before the ROLR event occurs.

The AER can appoint more than one retailer as a designated ROLR in any area. If it does so, the customers of the failed retailer will be allocated between the designated ROLRs.

Under the NERL, a ROLR event is triggered in a number of ways, including:

- the revocation of a retailer's retailer authorisation;
- the suspension of the retailer from the wholesale market by AEMO;
- the appointment of an insolvency official in respect of the retailer or any of its property; or
- the making of an order for the winding up of the retailer or the passing of a resolution for its winding up.

If any of these events occur, the AER must publish a notice advising that a ROLR

event has occurred and AEMO must begin the process to transfer the failed retailer's customers to the designated ROLR(s).

For small customers, a 'ROLR deemed small customer arrangement' is taken to apply between the designated ROLR and the small customer. The terms and conditions of this contract are those of the designated ROLR's standard retail contract. The prices are the ROLR's standing offer prices, with any variation in accordance with the ROLR cost recovery scheme. For large customers, the terms and conditions of the 'ROLR deemed large contract arrangement' are the terms and conditions published by the designated ROLR on its website, which must be fair and reasonable.

A designated ROLR may apply to the AER to recover certain costs related to the ROLR scheme. Default ROLRs may apply to recover their costs to prepare for a potential ROLR event and designated ROLRs may apply to recover their costs associated with an actual ROLR event.

5.3.2 Features of the ROLR provisions that may impact on the extent of financial contagion

The following features of the ROLR provisions in the NERL may be particularly relevant to the impacts on other participants of a retailer insolvency:

- A retailer's consent is not required for it to be appointed as a designated ROLR, although the AER must consult with that retailer. Also, it is not a prerequisite that a retailer submit an expression of interest for it to be appointed as a designated ROLR.[23]

- The AER may be required to act very quickly in applying the ROLR provisions. Timing and commercial considerations may prevent it from providing any advance notice of the likely ROLR event to default or additional ROLRs prior to them being appointed as a designated ROLR. This may limit the designated ROLR's ability to prepare to take on the obligations that come with its appointment.

- Timing and commercial considerations may also limit the AER's ability to appoint several retailers as designated ROLRs and therefore spread the customer base and associated financial liabilities across several participants in a region. The AER has indicated that timing constraints may often prevent it from approaching retailers that have submitted non-firm offers to be additional ROLRs, because there is insufficient time to negotiate terms with those parties. If the failing retailer is trying to sell its business as a going concern, the AER is also likely to be

23 We expect that it is unlikely in practice that a person would be appointed as a designated ROLR unless it was the default ROLR or had submitted an expression of interest and been registered as an additional ROLR. The most likely exception is where the default ROLR itself becomes insolvent and no additional ROLR is registered for some connection points. This appears to be a material risk in the situation we are focussing on of a large retailer insolvency.

sensitive to the commercial implications of approaching additional ROLRs to discuss their non-firm offers. This is because they may be potential purchasers and notifying them of a likely ROLR event would harm the prospects of a sale of the business.

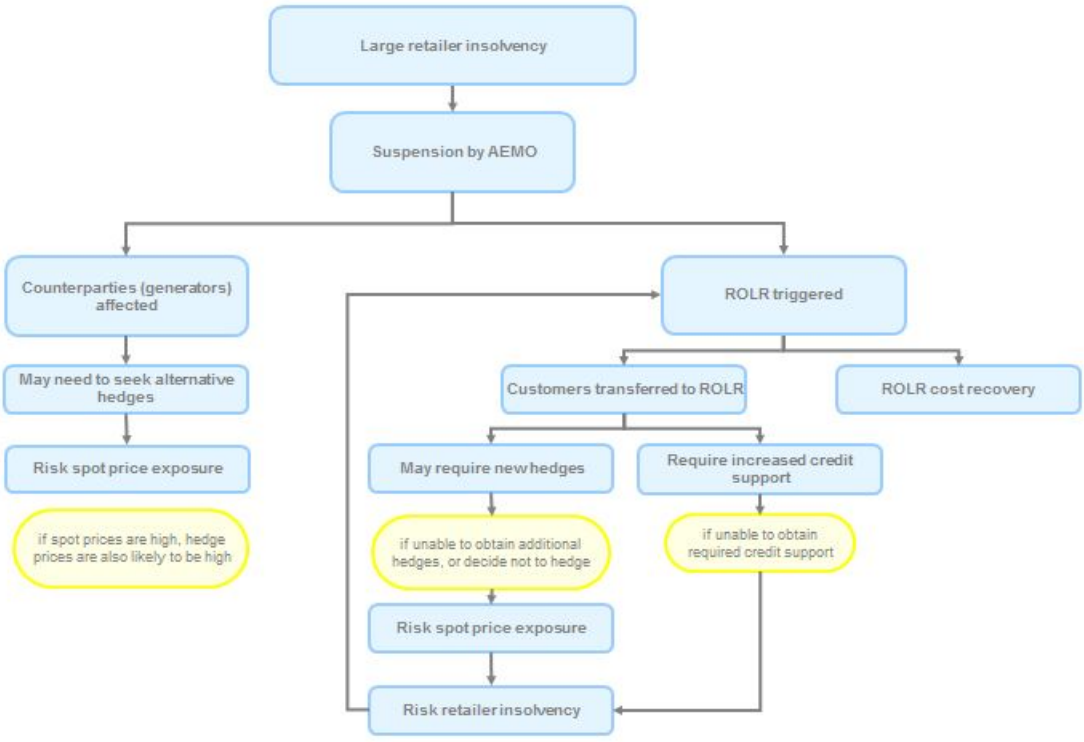
- The financial impact on the designated ROLR will depend in part on the extent to which it is able to recover its costs under the ROLR cost recovery provisions, which are largely untested.

5.3.3 Potential implications of a ROLR event

If a large retailer becomes insolvent and is suspended from the NEM, that will trigger a ROLR event. The financial implications for the retailer or retailers that are appointed as designated ROLRs will depend on a range of factors including how many customers they acquire and the level of spot prices at the time of the ROLR event.

These implications are illustrated in the following diagram and the key issues are explained below.

Figure 5.1 Potential effects of a large retailer insolvency and ROLR event



AEMO credit support requirements

Potentially the most significant and immediate impact on the designated ROLR will be the need to provide additional credit support to AEMO due to its increased customer demand.

Market participants are required to provide credit support to AEMO to cover their potential spot market liabilities. Under the current rules, AEMO determines a 'maximum credit limit' for each participant based on a reasonable worst case scenario of the participant's anticipated liabilities to AEMO.[24] A participant must provide credit support in the form of bank guarantees or an amount that is at least equal to its maximum credit limit. Participants also have a trading limit, which is currently set at 84 per cent of their credit limit. The margin between the credit and trading limits is designed to cover AEMO's potential liabilities during a seven day reaction period, ie the amount of time required to suspend a participant.

AEMO may amend a participant's maximum credit limit at any time. AEMO states that it will do so if there is a significant change in the projected customer load due to unusual customer transfer volumes.[25] A ROLR event in relation to a large retailer is anticipated to meet this criteria and result in AEMO amending the ROLR's maximum credit limit. By taking on the failed retailers' customers, the designated ROLR will substantially increase its expected customer load profile and it is likely that its maximum credit limit will increase significantly.

Although there are a wide range of circumstances that could lead to the insolvency of a retailer, that insolvency is most likely to occur during a period of high spot prices. That increase in spot prices may lead to the designated ROLR's outstandings to AEMO reaching unusually high levels and exceeding its trading limit, which would also require it to provide additional cash or credit support to AEMO. If AEMO issued a call notice and/or a default notice to the retailer due to a breach of its trading limit, it would be required to provide substantial additional credit support within 1-2 days.

In the prevailing adverse market conditions, credit support providers may be reluctant to provide additional support. Accordingly, obtaining this credit support is likely to be a critical challenge for any retailer that is appointed as a designated ROLR.

If the designated ROLR fails to provide the additional credit support within the required timeframe, AEMO would be expected to suspend it from the NEM. A retailer that has been suspended from the NEM will not be able to continue to trade and insolvency will almost certainly follow.

Other credit support requirements

As part of the NECF, a new chapter 6B will be added to the National Electricity Rules. Under this chapter, retailers can be required to provide credit support to DNSPs.[26]

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24 The AEMC is currently considering a rule change request submitted by AEMO to amend how the maximum credit limit is calculated so that it is based on a statistic referred to as the probability of a loss given default – see http://www.aemc.gov.au/Electricity/Rule-changes/Open/new-prudential-standard-and-framework-in-the-nem.html. It is not expected that this rule change will, if implemented, materially affect the analysis in this paper.

25 AEMO, *Credit Limits Methodology Paper*, version 9, 7 November 2011.

26 The new chapter 6B will be inserted by the National Electricity (Retail Support) Amendment Rules, which are part of the NECF package.

These credit support requirements currently exist in most jurisdictions, but will be harmonised under the NECF.

The designated ROLR is also likely to be required to increase its credit support with DNSPs as a consequence of acquiring additional customers. This increased credit support would need to be provided within ten business days of a request from the DNSP.

The customer contracts that will be acquired by the designated ROLR may well be profitable over the long term taking into account the costs of supplying those customers. However, the retailer will face significant costs in the very short term due to the need to provide increased credit support to AEMO and DNSPs. The retailer could therefore face liquidity and cash flow demands that it may not be able to meet in the short term, even though its longer term cash flows may be positive.

The financial pressures faced by the designated ROLR may be increased by constraints on its ability to pass on these costs by increasing retail prices. Retail prices are currently regulated in many jurisdictions, and even where prices are not capped by regulation there are limits on how frequently prices can be amended. In addition, the designated ROLR's ability to pass on increased costs will also be limited by the need to remain competitive with other retailers that are not designated ROLRs and did not incur similar costs.

Additional hedging requirements

The designated ROLR is likely to find itself largely unhedged in relation to the additional customer base that it acquires from the failed retailer, particularly given that it is unlikely to have received advance warning that it may be about to be designated as a ROLR.

As noted above, the retailer failure is most likely to occur during a period of high spot prices. The designated ROLR could therefore find itself substantially unhedged and exposed to spot prices at a time when those prices are abnormally high.

If the designated ROLR is a vertically integrated generator and retailer, its generation portfolio may provide some of the required hedge cover, but it is unlikely to be sufficient if the ROLR event relates to the failure of a large retailer.

Depending on the prevailing market conditions, it may be very expensive for the designated ROLR to obtain sufficient hedge cover to meet its increased customer load. Generators that were previously hedged with the failed retailer may be available to enter into hedge contracts with the designated ROLR, as they too will find themselves exposed to spot prices. However, a possible cause of the retailer failure may be a generation outage or the inadequacy of the failed retailer's hedge arrangements.

Although hedges are likely to be available in most circumstances, they are likely to be at high prices given that spot prices are likely to be significantly higher than usual at the time. The high cost of obtaining additional hedge cover could contribute to the financial problems faced by the designated ROLR.

Overall impact on the designated ROLR

In combination, these additional obligations are likely to be very large and require the designated ROLR to access a large amount of funds and credit support in a very short period. Although the designated ROLR will be earning increased revenue from its new customers to offset its increased cash flow obligations, it is unlikely that it will be able to begin billing these customers immediately.

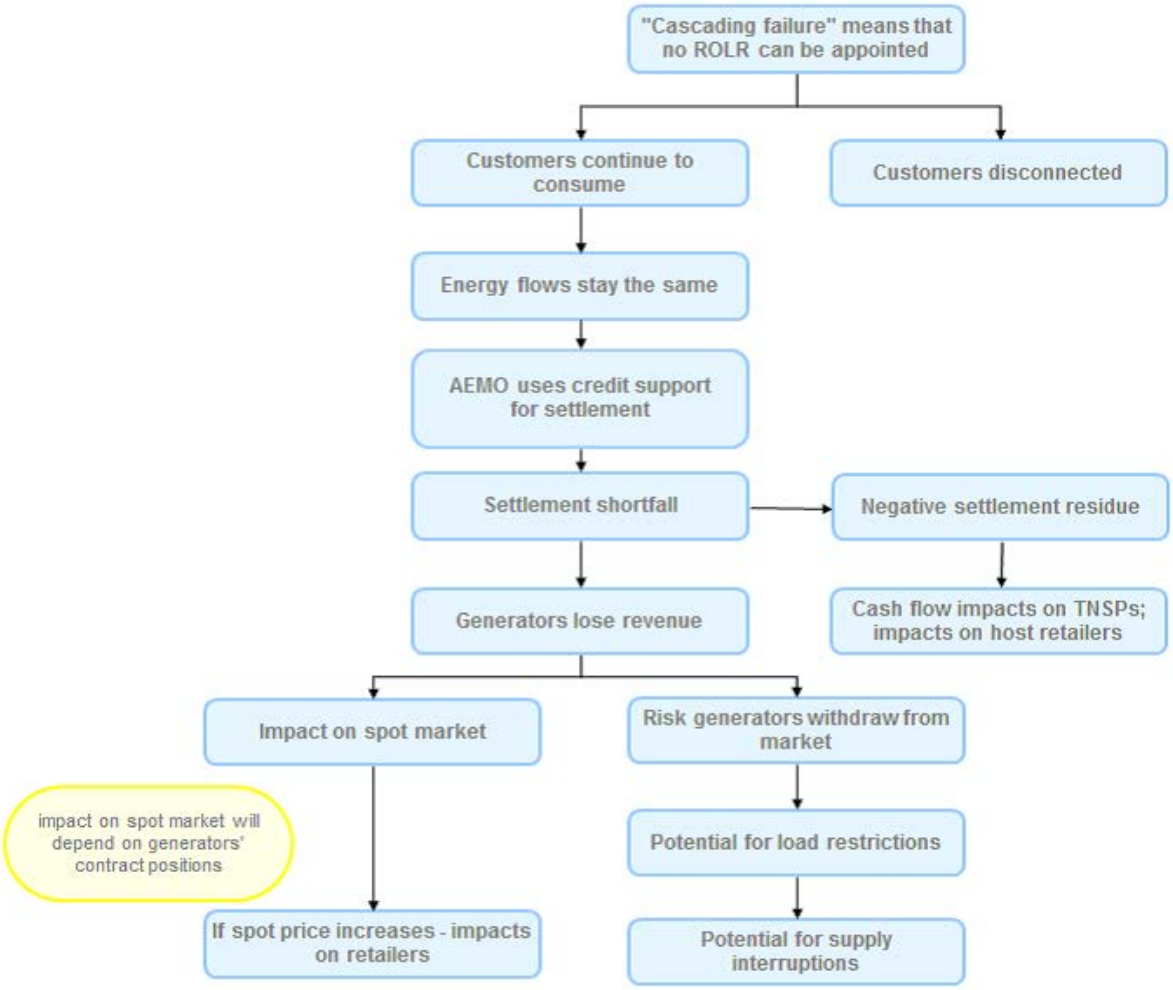
As a result, there is a risk that the designated ROLR would not be able to meet these liabilities.

Potential cascading retailer failure

If the designated ROLR is unable to meet its obligations, the ROLR itself may be suspended from the NEM. In a worst case scenario, this could trigger a "cascading retailer failure" as other retailers will then be appointed as designated ROLRs but there is a risk that they will also be unable to meet the obligations that they would take on as a ROLR. In these circumstances, it is possible that there may be no one that can effectively perform the role of designated ROLR.

The potential effects of a situation where the initial designated ROLRs have also become insolvent and there is no retailer that can be appointed as a designated ROLR are illustrated in the diagram on the following page.

Figure 5.2 Potential effects of a cascading retailer failure



Such an outcome could result in settlement shortfalls to generators and reduced cash flows for network businesses. This could create the potential of a system-wide failure. The likelihood of this outcome is very low, but the impacts on the long term interest of consumers would obviously be severe, despite resulting from a mechanism designed to protect them.

It is likely that significant government intervention would be required to stabilise the situation and allow some retailers to continue to operate and serve customers. That intervention would have direct costs that may ultimately be recovered from customers, as well as more significant lasting impacts on the efficiency of the market as a result of reduced investor confidence and reduced competition between the surviving retailers.

A cascading failure would also be likely to affect the financial position of generators, and affect their ability to invest the large amounts that are needed to build new generation capacity to meet increasing consumer demand in the coming years. It could also impact network businesses cash flows and investment. Combined, these impacts could reduce the level of reliability experienced by consumers.

6 Key issues for consultation

6.1 Our initial advice will focus on the potential contagion implications of a large retailer failure and ROLR event

The initial focus of our advice will be identifying the nature of the potential financial contagion risks arising from financial interdependencies between market participants.

Based on our initial analysis of potential financial contagion mechanisms, we consider that the key risks relate to the implications of the failure of a large retailer and the consequences of the operation of the ROLR mechanism. In addition, we consider that the ROLR arrangements should be a particular focus because in certain circumstances they could exacerbate the spread of contagion to multiple participants in the event of a large retailer failure.

Our initial analysis indicates that whatever causes the initial failure of a market participant, the financial interdependencies between participants create a risk that the initial failure could in extreme circumstances lead to a large retailer failing and a ROLR event (although noting that in most circumstances the existing risk management practices of participants are designed to act as a 'circuit breaker' that limits the extent of contagion). The financial liabilities imposed on the designated ROLR could then contribute to additional retailers failing, causing a risk of a cascading failure of multiple participants that could have significant detrimental impacts on the achievement of the NEO.

However, we recognise that there are several features of the ROLR arrangements which act to diffuse the risk of financial contagion.

For example, in many circumstances retailers will submit an expression of interest (EOI) and indicate their ability to perform the functions of the designated ROLR. Following that EOI process, retailers can be listed under a variety of categories including default ROLRs, or firm or non-firm additional ROLRs, potentially granting greater flexibility to regulators and retailers if there is a ROLR event.

It is also beneficial that multiple retailers can be appointed as designated ROLRs in relation to a ROLR event, as was the case in the Jackgreen example under previous jurisdictional ROLR arrangements. This feature of the arrangements acts to diffuse the risk of contagion, by reducing the financial liabilities that are taken on by any one retailer.

The two historical ROLR examples discussed in Appendix A show the ROLR arrangements working well to fulfil their objective of protecting consumers in the event of the failure of a small retailer. However, our advice will focus on potential weaknesses in the ROLR arrangements in the face of a large retailer collapse, an area in which they are untested to date.

We do not intend to completely review the ROLR arrangements or the operational functionality of the arrangements, which have been the topic of several studies by other parties including AEMO in recent years.

The focus of the advice and first interim report will be on the impact of a large NEM retailer failure, and the application of the ROLR provisions during such an event. Specifically, the work will consider the degree to which the application of the ROLR arrangements could contribute to financial contagion and outcomes that are inconsistent with the achievement of the NEO in the event of the collapse of a large retailer.

We will also investigate the extent to which elements of the NEM design, market participants' risk management processes and external risk management requirements already act to mitigate the risk of contagion and identify any gaps. We have not yet assessed the extent to which market participants' existing risk management strategies would be likely to be effective in removing or mitigating these potential contagion risks following a large retailer failure and ROLR event, but will do so as part of the next stage of this project.

6.2 Questions for stakeholders

The Commission welcomes submissions on any of the issues discussed in this paper. In particular, the Commission is interested in stakeholder's view on the following questions.

Box 6.1: Questions for consultation

Has this issues paper adequately identified and considered:

- **the nature of financial interdependencies between NEM participants;**
- **the potential risks associated with those financial interdependencies;**
- **the potential financial contagion risks that could arise as a result of the failure of a large retailer; and**
- **the potential financial contagion risks that could arise as a result of the failure of a large generator?**

The Commission invites general comments on the discussion of financial interdependencies and potential for financial contagion in this issues paper.

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AFS	Australian Financial Services
APRA	Australian Prudential Regulation Authority
ASIC	Australian Securities and Investments Commission
ASX	Australian Securities Exchange
DNSPs	distribution network service providers
EOI	expression of interest
ISDA	International Swaps and Derivatives Association
NECF	National Energy Consumer Framework
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NERL	National Energy Retail Law
OTC	over the counter
ROLR	retailer of last resort
SCER	Standing Council on Energy and Resources
SFE	Sydney Futures Exchange

A Examples of previous retailer of last resort events in the NEM

Box A.1: Energy One - 2007

Prior to its suspension from the NEM in June 2007, EnergyOne was an electricity retailer, with a focus on small business customers predominantly in New South Wales. It had 5,000 customers in total, with only two customers in Victoria, one in the ACT and about 160 in Queensland.

The company described itself as a 'specialised energy provider to businesses, body corporate and residential customers'.

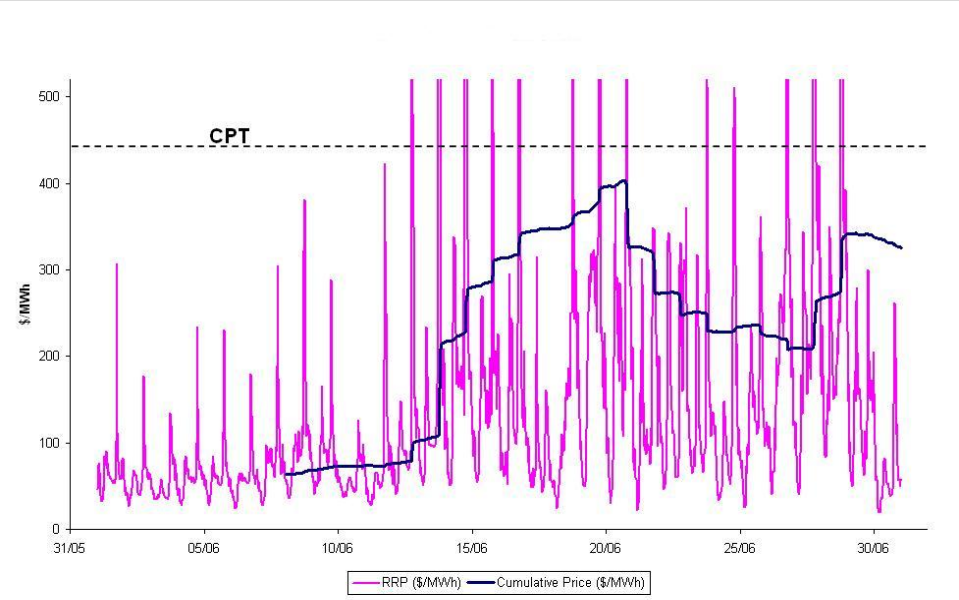
NEMMCO (the predecessor to AEMO as the market operator) suspended EnergyOne with effect from midnight on 22 June 2007 after receiving advice that the company did not intend to carry on its business in the NEM.

The reasons for EnergyOne ceasing to operate in the NEM are not entirely clear. The company exists today as a specialist business, mainly focussed on electricity trading software, market data and meter data management solutions.

In June 2007 the spot price in New South Wales repeatedly reached very high levels over a series of days. The event is mainly attributed to the effects of drought, which caused water shortages at power stations in inland southern Queensland and inland NSW, reducing thermal plant availability. The event featured regular daily spikes that emerged at peak demand periods each day. As a result an Administered Price Period came close to being triggered.

Figure A.1 shows the half-hourly spot price in the NSW region during the event, as well as the calculation of cumulative prices across a rolling 336-period window. The cumulative prices and the Cumulative Price Threshold (CPT) are both shown in per-half-hour terms so that they can be compared more easily to the half-hourly spot price.

Figure A.1 Spot prices during June 2007



This data clearly indicates that, absent the presence of any hedge contracts, a retailer with significant exposure to the spot price in NSW would have in fact suffered very heavy losses in June of 2007.

Some commentators however argued that high spot prices were not driving any financial stress in the company, but were rather driving a strategic opportunity for Energy One to exit the market; and that this is what motivated the withdrawal.

The Consumer Action Law Centre stated that *"Energy One retained its highly valuable hedge contracts and continues to trade with a new focus on its billing software systems, suggesting that it was not pushed to withdraw from the market due to solvency concerns. If Energy One's withdrawal is strategic, it highlights considerable problems with the structure of the national energy market, and its consequent ability to bring about efficient outcomes that are in the long term interests of consumers."*[27]

The narrative of the event on Allens Arthur Robinson's website states: *"Given that there has been no announcement that Energy One has entered into external administration, it appears that NEMMCO has exercised its suspension rights on the basis that Energy One had threatened 'to cease to carry on its business [as a market participant]'."*[28]

Though less documentation remains publicly on record than in the Jackgreen case discussed below, the ROLR framework here appears to also have operated relatively effectively to transfer customers over to a new retailer. This was the

27 Consumer Action Law Centre, *On the Wire*, September 2007, p19.

28 Allens Arthur Robinson, *Focus: Energy - June 2007*, 25 June 2007. Available at: http://www.allens.com.au/pubs/ener/foenerjun07.htm.

first ROLR event in the NEM, but given the low volume of customers involved did not lead to any financial contagion or other systemic market issues.

However, as in the Jackgreen case below, affected customers were generally levied a fee to recover the cost of transfer to their new retailer.

Box A.2: Jackgreen - 2009

Jackgreen Energy became a registered NEM retailer in 2004. Prior to its collapse, the company employed around 100 staff and had around 75,000 customers across the NEM.

The company went into voluntary administration at 9pm on 18 December 2009. The company was suspended from the NEM effective from midnight on 18 December 2009.

Jackgreen's publicly available statements argue that they suffered from 'squeezing' by the larger retailers, who undercut their prices in order to shut them out of the market. The statements also allude to very high spot prices caused by hot weather in November 2009, which despite the existence of hedge arrangements, caused the company some financial stress.

While it was hot in South Australia and Victoria in November 2009, only South Australia experienced spot price volatility as a result. This volatility was extreme however, resulting in the Cumulative Price Threshold being exceeded and the Administered Price Cap coming into force.

Spot prices were also very high during this period in NSW, due in part to a transmission line constraint. Jackgreen's administration was triggered by a failure to make network payments to the NSW distributor Integral Energy.

The ROLR provisions were activated in all the jurisdictions and Jackgreen's customers were passed to an array of different retailers across the NEM. The ROLR processes appear to have operated smoothly across all the jurisdictions, though each followed its own unique process to a degree.

In South Australia, customers were first transferred to the distributor ETSA Utilities before being transferred to AGL SA. TRUenergy and Origin were permitted to charge a fee to recover the cost of transfer to the adopted customers. Both were approved by the Essential Services Commission.

The process in Queensland made a clear delineation between small and large customers; as the small customers were transferred to standing offers while the large were transferred to more complex contracts that reflect the spot price and contain network cost-pass-through components.

It appears that the ROLR arrangements performed reasonably well in this case.

This is most likely because the arrangements were designed with this type of failure in mind. That is, they were designed to cope with a small retailer announcing its failure in isolation of other NEM participants, by quickly getting the orphaned customers to a new retailer without interrupting market operation or security of supply to the affected customers.