AEMC

REVIEW

Australian Energy Market Commission

STAGE TWO OPTIONS PAPER

NEM Financial Market Resilience

8 November 2013

Submissions due 19 December 2013. Reference: EMO0024

Inquiries

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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 established the Standing Council on Energy and Resources (SCER) to replace the MCE. The AEMC has two main functions. We make and amend the national electricity, gas and energy retail rules, and we conduct independent reviews of the energy markets for the SCER.

Executive summary

This options paper commences stage 2 of our advice to the Standing Council on Energy and Resources (SCER) on the potential risks arising from financial interdependencies between participants in the National Electricity Market (NEM).

Market participants actively manage a range of risks and some of the interdependencies, such as hedging contracts, reflect appropriate risk management. However, they also have the potential to transmit financial distress between participants. For example, if one participant's financial difficulties cause it to default on its hedge contracts, this could have a detrimental impact on all those participants with whom it has contracts, and this in turn could cause wider financial distress and a cascading impact across the NEM.

The global financial crisis (GFC) demonstrated the potential in other markets for financial difficulties to be transmitted from one business to others, resulting in financial contagion that has widespread negative effects on the efficacy of the market and the interests of consumers. This potential for financial interdependencies to cause financial contagion, and at an extreme to risk the collapse of an entire market, is known as systemic risk.

SCER has asked the Australian Energy Market Commission (AEMC) to provide advice on:

- the risks to financial stability in the NEM from these interdependencies between market participants, and the impact of those risks if they materialise;
- existing mechanisms to manage those risks, and whether they are adequate; and
- if inadequate, how to strengthen, enhance or supplement those mechanisms.

The first stage of our review focused on the risk of financial contagion arising from the failure of a large retailer and associated retailer of last resort event, as this was recognised as a key risk. We have published draft recommendations in relation to this issue in our first interim report.

The objective of the second stage to this review is to assess other possible risks of financial contagion in the NEM. This paper commences the second stage and has four purposes:

1. It discusses the meaning of financial contagion and systemic risk in the context of the NEM, in light of the financial relationships between market participants. This highlights the important role played by hedging instruments, both as tool for managing spot price risk, and also as a potential source of financial contagion.
2. It outlines the risks faced by retailers and generators operating in the electricity market, and explains how those risks are currently managed, both through the regulatory framework and through the internal risk management practices of market participants. This includes the arrangements used by market participants to mitigate the impact on their business of other participants failing.

3. It considers if and how the degree of systemic risk in the NEM might be assessed, and invites stakeholder views on whether we have identified all the potential channels of financial contagion in the NEM.
4. It explores a range of measures that aim to reduce systemic risk in the NEM, if considered necessary. Such measures either seek to increase transparency regarding financial interdependencies, or change risk management arrangements.

The focus of the review is on the stability of the NEM as a whole, and not on ensuring that individual businesses do not fail. Nonetheless, in aiming to reduce the risk of systemic failure, some measures may strengthen the financial resilience of individual businesses.

The NEM has operated effectively to date, with businesses entering and exiting the market without causing widespread financial distress. However, the failure of a large business could have significant flow-on effects in the NEM which could trigger multiple failures with significant impacts on customers. In the extreme case, this could lead to the need for government to intervene and support the market, as has been necessary in other sectors such as insurance, banking and childcare.

In evaluating the possible introduction of any measures, the Commission will consider whether they represent a proportionate response to address any identified concerns about systemic risk in the NEM, in that they are likely to achieve clearly articulated benefits without imposing disproportionate costs.

The measures considered include the 'Group of 20' (G20) recommendations on reforms in the over-the-counter (OTC) derivative market, which Australia is currently in the process of implementing. The Treasury has indicated that the Australian Government will consider whether it is appropriate to impose any G20 requirements in relation to electricity derivatives after the completion of the AEMC's advice.

The paper also discusses potential measures that are not part of the G20 reforms. These measures extend beyond a direct focus on OTC contracts, to consider the risk management position of market participants more broadly.

This paper does not contain any recommendations. Rather, the Commission is interested in seeking stakeholder views on the issues raised and to develop a better understanding of:

- the potential for financial contagion due to interdependencies between market participants, particularly those resulting from their hedging arrangements;
- the adequacy of current risk management arrangements to mitigate the risk of financial contagion;
- the potential benefits of a range of measures, in terms of their capacity to increase transparency and reduce systemic risk; and
- the potential disadvantages and costs associated with each option.

We will consider stakeholders' comments as part of the development of our draft recommendations to SCER on these issues, which will be set out in a second interim report to be published in early 2014.

Financial contagion and systemic risk

Participants in the NEM are interconnected through a web of financial relations and interdependencies, via both the wholesale spot market and the contract market. The extent to which these relationships can also act as transmission channels for financial contagion will depend on the risk management strategies of participants, and may be magnified by prevailing market conditions and shocks to the system. For example, high spot prices will increase the costs for a retailer of replacing any contracts.

Risks and risk management

Market participants are exposed to a variety of risks when buying and selling electricity in the NEM, including settlement risk, market risk, credit risk and cash-flow risk. Managing these risks is an integral part of a participant's day-to-day operations.

Many NEM businesses are vertically integrated or horizontally diversified – meaning they are involved in a range of activities either within the NEM or outside the electricity sector. Their risk management strategies address these risks faced by the organisation as a whole, not just NEM-related activities. Similarly, the inter-relationships between NEM participants - and their associated risks and exposures - may involve activities outside the electricity sector, in addition to their NEM activities (eg, gas supply).

Participants use a myriad of instruments and strategies to manage these risks, suited to their individual situations. These include the use of periodic stress tests and regular valuation of their exposures to other participants in order to assess their risk position. Participants also manage their exposure to counterparties by restricting the size and duration of their transactions, depending on the credit worthiness of each counterparty.

An important feature of the NEM is the use of derivative instruments to manage price volatility on the wholesale spot market. Derivative contracts can be negotiated bilaterally through OTC derivatives or traded on the ASX 24 energy futures exchange.

During 2012-13, the total volume of OTC contracts reported was 292 million MWhs. This is equivalent to 1.6 times the total NEM demand of 184 million MWhs during that year. For the same period, volume on the ASX 24 energy futures exchange traded 1.9 times underlying NEM system demand. Therefore in total, derivative contracts relating to the NEM were approximately 3.5 times total demand during the previous financial year. We note that both the liquidity of the derivatives contracts available and the volume of contracts traded vary significantly between NEM regions.

Participants are also increasingly managing risk internally, through vertical integration. This provides the company with a natural internal hedge against spot price risk, to the extent that their generation and retail activities have complementary risk profiles.

Risk management in the NEM involves continuous trade-off decisions regarding the degree to which they are exposed to various sources of risk. For example, participants may use OTC derivatives to manage market risk, but this increases their exposure to credit risk arising from the possibility of a counterparty defaulting on its obligations under the OTC contract.

Risk management takes place in a framework both of internal policies and external risk management obligations. External obligations arise through a range of sources, including:

- regulatory requirements, such as license requirements administered by the Australian Securities and Investments Commission (ASIC);
- prudential requirements administered by the Australian Energy Market Operator (AEMO) as a condition of operating in the wholesale electricity market; and
- obligations imposed by lenders as a condition of financing arrangements.

Measuring the materiality of systemic risk

Measuring the degree of systemic risk in the NEM is not straightforward. A number of indicators, such as level of market concentration, could assist in that exercise, but they are unlikely to provide a complete and conclusive picture. We also note that the potential for systemic risk in the NEM will depend on the actual behaviour of market participants both before and during any event involving counterparty default.

For this reason, evaluating the potential usefulness of new measures is not a simple analysis, and will require judgement in balancing the likely benefits against the costs imposed, both on NEM participants and across the NEM and the economy more broadly.

We have focused our assessment on the financial interdependencies caused by OTC contracts. This could be a potential source of financial contagion, compared to the other financial relationships, for a number of factors. These include:

- Electricity derivative OTC contracts tend not to have any collateral supporting the transaction. This means that in an event of default, a counterparty cannot access such collateral to off-set a loss;
- the volume of reported OTC contracts which are traded through financial organisations acting as intermediaries is less than 10%. Financial intermediaries are subject to more stringent regulations regarding risk management; and
- around 70% of reported OTC trades are concentrated between just four counterparties.

Overview of Options

This paper explores a range of measures that aim to increase transparency or improve risk management and thereby reduce systemic risk in the NEM. These measures include the G20 reforms regarding OTC derivatives, together with measures that consider the risk management position of participants more broadly.

Transparency is considered important to reduce systemic risk for a number of reasons. Greater transparency can assist regulators in monitoring the interconnectedness of participants, and the characteristics of the financial system supporting the NEM as a whole. Transparency also reduces any role that uncertainty might play in times of financial distress in magnifying the risk of contagion.

We have not reconsidered measures to change the design of the wholesale market that were assessed as part of stage 1 of this review – such as a temporary cap on the spot market price following the default of a large retailer. Concerns raised at that time highlighted the potential for these measures to have wide-reaching implications for the operation of the NEM and the allocation of risks.

The paper also combines measures into a number of options to facilitate consultation, though this review is not limited to considering only these options:

- the base case is an option not to implement any new measures because no additional measures can be justified;
- an option that seeks to increase transparency about risk in the market by requiring market participants to report details of OTC transactions they enter into, consistent with the implementation of the G20 arrangements in relation to OTCs for other products;
- an option that seeks to test, and improve the transparency of, the ability of market participants to absorb financial shocks, by requiring market participants to regularly perform a stress test and report on the outcome;
- an option which introduces a code of best practice for risk management by NEM participants, with regular attestation by participants that they have complied with the code. This would provide additional confidence about the capacity of NEM participants to manage financial shocks;
- an option that seeks to enhance credit support and market information arrangements by market participants - this option combines reporting obligations with a requirement on market participants to provide credit support against OTC transactions they undertake; and
- an option that seeks to introduce additional supervision by a regulator, with powers to respond to emerging systemic threats in the NEM.

These options do not seek to replace companies' internal risk management practices. Rather, in conjunction with the already existing regulatory framework, they seek to complement internal risk management practices, and contribute to a better understanding and management of risks in the market with a view to reducing the likelihood of financial contagion following a potential market participant default.

Assessment framework

We have developed an assessment framework and criteria to assess the potential implementation of any option, relative to the alternative of making no changes to the current regulatory arrangements. In this, the AEMC is guided by the potential for any option to enhance the achievement of the National Electricity Objective (NEO).

The assessment criteria provide a framework for considering the costs and benefits of implementing new measures in the context of the specific characteristics of the electricity market, and the role of derivative instruments in hedging spot market risk.

The effectiveness of any measure must be assessed, including the potential for participants to undermine its effectiveness through adapting their behaviour. We will also consider how any new measure would relate to existing obligations on market participants, such as those under the Corporations Act and accounting standards.

Furthermore, we will consider whether the potential benefits of a proposed measure are proportionate to any disadvantages or costs they impose. Changes to the regulatory framework will have implications for the allocation of risks in the NEM, and for the resulting incentives for participants. As a result, the interaction of an option with other

causes of risk, that may precipitate or magnify the impact of financial contagion, needs to be included in the assessment framework.

The paper does not address the risk of financial distress being transmitted through the retailer of last resort mechanism after an individual retailer default. This was considered in stage one of this review. For this reason, implementation of any of the options put forward in this paper does not preclude implementing improvements recommended in stage 1 of the review.

Responding to this paper and next steps

The AEMC welcomes stakeholders' views on the options and the questions included in this paper. The AEMC also encourages participants to discuss alternative options they consider appropriate.

The Commission invites submissions on this paper by 19 December 2013.

Stakeholder submissions will be a critical input to the Commission's development of recommendations.

This paper will be followed by a second interim report, to be published in the first quarter of 2014, which will include the Commission's draft recommendations for the second stage of the review.

The Commission's final recommendations to SCER will be published in a final report in mid-2014.

Contents

1 Introduction

1.1 Stage two of the NEM financial resilience review

This options paper commences stage two of our advice to the Standing Council on Energy and Resources (SCER) on the resilience of the financial relations and markets that underpin the efficient operation of the National Electricity Market (NEM). The aim of this review is to consider whether the financial relationships and markets underpinning the NEM are sufficiently robust to manage the financial consequences of an individual market participant defaulting on its obligations.

The NEM has operated effectively to date, with businesses entering and exiting the market without causing widespread financial distress. However, the failure of a large business could have significant flow-on effects in the market. The global financial crisis demonstrated the potential in other markets for financial difficulties to be transmitted from one business to others, resulting in financial contagion that has widespread negative effects on the efficiency of the market and the interests of consumers.

This paper sets out for public consultation a description of risks and current risk management practises in the NEM, and a range of measures that have the objective of reducing the risk of financial contagion. These measures include the 'Group of 20' (G20) recommendations on reforms in the over-the-counter (OTC) derivative market. The paper also seeks views on whether there is a material potential for systemic risk in the NEM, and if so how best to address that risk.

Australia is currently in the process of implementing the G20 commitments. No determination regarding the potential applicability of these commitments to electricity OTC derivatives in Australia has yet been made. Treasury has indicated that the Australian Government will consider whether it is appropriate to impose any G20 requirements in relation to electricity derivatives after the completion of the AEMC's NEM financial market resilience advice.[1]

The paper also includes other measures for consideration. These measures relate to the overall risk management position of market participants across all their trading activities, rather than being directly focused on OTC contracts. It is important that such measures be included in the suite of measures being considered as they could potentially reduce any risk of financial contagion.

This paper aims to provide a basis for discussion with stakeholders on the questions and issues associated with potential implementation of such measures for the electricity market. No recommendations regarding possible implementation of any such measures are made at this stage, nor is there any presumption that additional measures are required. Rather, the outcome of the stakeholder discussion will further inform the Commission's analysis for stage 2 of the NEM financial market resilience review.

The Commission is cognisant of the important role played by hedging instruments in the NEM. In evaluating proposed measures, the Commission will consider whether

1 See The Treasury, *Implementation of Australia's G-20 over-the-counter derivatives commitments, proposals paper*, December 2012, pp13-14; and *Ministerial trade reporting determination, Section 901B(2) Corporations Act 2001, explanatory statement*, 2 May 2013, paragraph 15.

they represent a proportionate response to any identified concerns about systemic risk in the NEM, and take account of broader implications such as their impact on risk allocation and the efficient operation of the NEM.

1.2 The Review

The SCER has requested that the AEMC provide advice on the following issues:

- the risks to financial stability in the NEM arising from financial interdependencies between market 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; and
- if they are inadequate, recommendations to strengthen, enhance or supplement the mechanisms for minimising the risks and consequences. In this, both preventative and responsive mechanisms should be considered.

The request for advice provides that the AEMC consider, amongst other things:

- the National Electricity Objective (NEO);
- relevant developments in electricity markets in other jurisdictions;
- approaches to financial stability regulation in other markets;
- 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.

Scope of stage 1 of the review

The AEMC's first interim report, published on 4 June 2013, focused on 'post-event' measures that seek to mitigate the risks of contagion following the financial distress of a large retailer. This approach reflected the analysis underlying the issues paper and the stage 1 options paper, and consideration of submissions to those papers.[2]

That analysis demonstrated that a risk of financial contagion could arise if a large retailer failed and triggered a retailer-of-last-resort (ROLR) event, which could potentially lead to a "cascading retailer failure" if the retailer that is appointed as the ROLR is unable to meet its consequent additional liabilities and also fails. Almost all submitters agreed this scenario was the most likely to cause a risk of contagion and should be addressed as our first priority.

2 The AEMC published an issues paper in June 2012 and a stage 1 options paper in November 2012.

Scope of stage 2 of the review

The second stage of our advice is examining other potential sources of financial contagion in the NEM, to assess whether there are any material risks to the stability of the NEM arising from financial interdependencies between market participants. These risks to the stability of the NEM are also known as systemic risks.

In accordance with SCER's request for advice, our analysis will be limited to risks of financial contagion that could threaten the stability of the NEM as a whole and hinder achievement of the NEO. Our advice will consider whether any measures, including G20 recommendations, would promote better management of such systemic risks.

The scope of our advice will not extend to measures that are designed to prevent the failure of an individual market participant per se, where that failure is unlikely to cause broader financial contagion.

Instead, the focus of the second interim report will be on ensuring that the financial distress of one participant does not impact other participants and consumers in a way that could affect market stability and the long term interests of consumers.

1.3 Working group and advisory committee

The SCER request for advice requires the Commission to draw on input from market participants in preparing its advice, including establishing an industry working group and an advisory committee.

The working group comprises representatives from the following market participants:

- AGL Energy;
- Alinta Energy;
- Australian Power and Gas;
- Energy Australia;
- International Power GDF Suez;
- Origin Energy;
- Snowy Hydro; and
- Stanwell Corporation.

We have also established an advisory committee so that any recommendations that we may make in our subsequent reports consider all relevant policy and regulatory requirements. The advisory committee comprises representatives from:

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

In order to gain a better understanding of risk management by NEM participants, we have conducted meetings with a number of individual members of the working group and the advisory committee.

In addition, we have held meetings with representatives from the following organisations:

- ASX Energy (formerly D-cypha Trade);
- Australia and New Zealand Banking Group Limited (ANZ);
- Australian Prudential Regulatory Authority (APRA);
- InterGen (Australia);
- Macquarie Bank;
- National Australia Bank;
- Standard and Poor's; and
- Westpac Institutional Bank.

The information gathered during these meetings has assisted us in the drafting of this paper. However, the views expressed in this paper are not to be attributed to any member of the working group, advisory committee, or organisations with whom we have met in the course of this review.

1.4 Responding to this paper

The Commission welcomes submissions on any of the issues raised in this options paper.

In particular, we are interested in stakeholders' views on the following questions:

- Is there risk of financial contagion in the NEM due to the hedging arrangements between participants?
- How can the materiality of systemic risk best be measured?
- In relation to each of the options discussed in this paper:
  - How effective is the option likely to be?
  - What are the likely costs and benefits of each option?
  - Are the expected benefits of each option likely to outweigh the potential costs and disadvantages?
  - Are there alternative measures that could be considered?

A complete list of consultation questions is included in chapter nine.

The closing date for submissions is 19 December 2013.

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.

1.5 Structure of this paper

The remainder of this paper is structured as follows:

- Chapter 2 outlines the risk of financial contagion arising from the financial interdependencies of market participants;
- Chapter 3 describes the main risks faced by market participants in the NEM, and how participants manage those risks;
- Chapter 4 addresses the question how the materiality of systemic risk can best be assessed;
- Chapter 5 provides an overview of a number of measures that could be implemented in order to increase transparency and improve risk management with a view to reducing systemic risk. These include the G20 measures as well as measures that could be considered in addition to, or as an alternative for the G20 measures;
- Chapter 6 sets out the assessment framework that the AEMC intends to apply when considering the possible implementation of a number of measures in the context of the NEM;
- Chapter 7 describes the various measures, outlined in chapter 5, in more detail;
- Chapter 8 describes a number of options, consisting of possible combinations of measures, that could be implemented in order to reduce systemic risk. These options are intended to facilitate dialogue with stakeholders on the costs and benefits associated with implementation of the various measures;
- Chapter 9 summarises the consultation questions;
- Appendix A provides an overview of the G20 measures aimed at reforming the regulation of OTC derivatives and describes the implementation of the G20 measures in Australia, the European Union and the United States; and
- Appendix B describes the stress test reporting regime currently in place in New Zealand for the electricity market.

2 Financial contagion and systemic risk

This stage of our advice examines potential sources of financial contagion in the NEM, to assess whether there is material risk to the stability of the NEM arising from financial interdependencies between market participants. The risk to stability of the NEM arising from financial interdependencies between market participants is also known as 'systemic risk'.

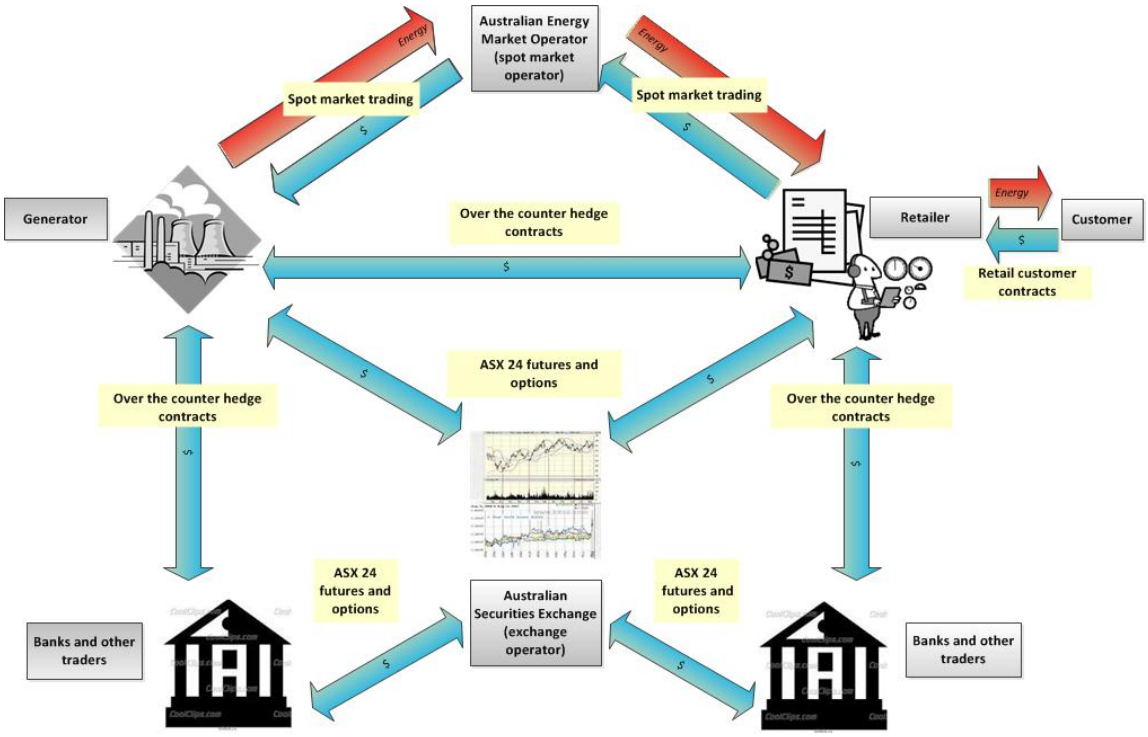
The following three concepts are central to understanding and assessing systemic risk in the NEM:

- interconnectedness between market participants;
- financial contagion; and
- coincidence.

Interconnectedness refers to the phenomenon that a web of direct and indirect financial relationships exists between participants in the NEM, which means that the financial position of a market participant is directly dependent on the behaviour of other market participants.

As the figure below illustrates, interconnectedness between market participants exists through financial relationships in both the wholesale spot market (the top half of the figure) and in the financial contract market (the bottom half of the figure).

Figure 2.1 Financial relationships between market participants in the NEM



There are three main channels through which market participants are financially interconnected:

1. In the wholesale spot market, via the settlements process that is managed by AEMO. In particular, generators are dependent on retailers making payments for the purchase of electricity through the spot market.
2. Through the ASX 24 which is a centralised exchange that offers standardised electricity futures and options products. These products are also explained in more detail in chapter three.
3. Through bilateral 'over-the-counter' (OTC) hedge contracts between participants and sometimes intermediaries. Participants use OTCs to manage the risk of variations in the wholesale regional spot prices. These contracts are discussed in more detail in chapter three.

These financial interconnections have the potential to expose participants to changes in the financial position of their counterparties. The potential for the financial distress of one participant to be transmitted to other participants is known as *financial contagion*.

Financial contagion occurs where the failure of, or large losses borne by, one market participant precipitates the failure of, or large losses borne by, a second participant because the second has an exposure to the first participant. This in turn may set off a chain reaction of further failures due to the credit exposure faced by successive participants.

In a market with extensive interconnectedness the contagion could therefore cause a 'cascading' effect, as participants progressively encounter financial difficulties and potentially even collapse in response to the financial difficulties of other participants. Hence contagion denotes the process whereby the failure of one participant causes other participants to fail as well.

The potential for each of the three channels of financial interconnectedness outlined above to cause financial contagion is likely to differ. We do not consider that the settlements process creates a significant risk of financial contagion, because AEMO requires participants in the spot market to meet substantial prudential requirements, as discussed in section 3.1.1. The prudential regime is designed to achieve a 2 per cent probability of loss following default, restricting residual settlement risk to very low probability events.

Similarly, we do not consider the contracts traded via the ASX 24 exchange to be a significant cause of financial contagion. There is no direct relationship between generators and retailers when they buy and sell futures and options on the ASX 24, so there is no direct link for financial distress of one of these parties being transmitted to the other. The risk of non-payment (ie, the credit risk) is borne by the ASX, which manages this risk by requiring participants to make margin payments. As explained in chapter three, the ASX also calculates variation margins based on daily price movements.

However we note that by centralising the management of credit risk, centralised exchanges may become the source of systemic risk in the market. Therefore the regulatory arrangements governing the exchange, as well as risk management practices adopted by the exchange, become very important.

The third channel for financial interconnectedness between market participants is the use of OTC derivative contracts. These contracts are central to the management of spot price risk, as explained further in chapter three. Nonetheless, they may also act to transmit financial distress from one participant to another, if a counterparty defaults on the payments due under a contract. This is referred to as counterparty risk.

The impact of a counterparty defaulting includes both direct losses and the secondary effects caused by a participant leaving the market:

- *Direct* losses relate to the loss of payments under the contract and also the cost of replacing those contracts. The magnitude of loss of payment will depend upon the settlement periods for OTC contracts, which tend to be around 4-5 weeks of payments, and also upon the probability of the participant receiving the termination payout from the administrators of the defaulting participant.

  The costs of replacing failed contracts will be incurred over the duration of those contracts. Hence counterparty default may not cause immediate contagion as the costs of replacing contracts can be spread out over the time of the initial contract.[3]

- *Secondary effects* relate to how default by an individual market participant could affect both market conditions (such as the spot price or the availability of generation) and also the creditworthiness of other participants. During the global financial crisis, the impact of individual participants failing was exacerbated by uncertainty about which other businesses were in imminent danger of failing, causing a 'freeze' in liquidity and financing.

Apart from the degree of interconnectedness, the potential for financial contagion is likely to be exacerbated if:

- market participants do not hold significant cash reserves, or the capacity to gain additional finance, so they are less able to absorb the impact of financial shocks;
- there are large uncollateralised exposures, so that a participant cannot call on the collateral when a counterparty fails to meet its obligations; and
- there is insufficient information being available to market participants about market activity to adequately assess risk on a whole-of-market basis arising from the interconnectedness between market participants.

We use the term *coincidence* to describe the possibility of severe losses or even failure of multiple participants due to a number of unfavourable events occurring at the same time as the failure of an individual participant. For example, high spot prices together with generation plant outages and a squeeze on the general availability of credit would magnify the impacts of a counterparty default. Such events tend to be unexpected and not reflective of normal market conditions.

Interconnectedness, contagion, and coincidence are all interrelated. The possibility and severity of financial contagion in the NEM will be determined by the degree of

3 We note however, that, under accountancy rules, the non-defaulting counterparty may be required to immediately write off the total value of the loss. This may then cause the business to breach its debt covenants with banks, which in turn could cause the company's default, leading to contagion.

interconnectedness between market participants. These interconnections, together with a coincidence of unfavourable events, in turn could precipitate financial contagion.

The effects of contagion can also erode market confidence in the market structure and make consumers, governments and their agencies more risk averse. 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.

Given the experience in financial markets, it is therefore prudent to determine the extent to which systemic risk exists in the NEM and to consider possible strategies to reduce that risk or mitigate any consequences of contagion, if deemed necessary.

In stage one of this review, we identified the event of the failure of a large retailer triggering the operation of the retailer of last resort arrangements as a potential source of contagion. The first interim report developed mechanisms to deal with this and highlighted the impact of correlated events, such as high spot prices, in increasing the risks.

In stage two, we are assessing the possibility of contagion arising as a result of counterparty risk existing under the financial contracts between market participants. In doing so, the AEMC recognises the importance of these financial contracts for participants managing market price risks. Also, we recognise the need to consider the broad range of financial transactions and relationships that affect the overall financial position of market participants.

Hence our analysis will not solely be limited to consideration of contagion through OTC contracts, but will evaluate how one participant defaulting on an OTC contract could affect the overall financial position of other participants. This is also consistent with how market participants develop their risk management strategies.

We note that interconnectedness could also be manifested via indirect channels, such as the liquidity of the contract market. The failure of large market participants can shrink liquidity in the contract markets and thus intensify the financial impact felt by other participants. Some of these indirect effects will be taken into account when examining the costs and benefits of various measures that could be considered.

In addition, participants are intimately connected through the funding and asset markets, such that financial stress in one part of the market, which leads providers of funding to increase financing costs or even retreat from the market generally, can generate stress by other participants. Furthermore if a participant is forced to sell assets in times of financial stress, then that could affect the value of similar assets held by other participants as well.

The approach to stage two accommodates the request for the AEMC to provide advice on the application of the G20 recommendations on OTC derivative trading to electricity derivatives.

To assess the risk that the failure of one market participant will lead to the subsequent failure of other participants due to the nature of hedging arrangements between participants, an evaluation of the following four issues is particularly important:

(a) whether market participants are able to correctly identify their level of interconnectedness with other market participants and are able to quantify their potential liabilities of a counterparty default;

(b) whether participants are determining their trading credit limits with other market participants to appropriately mitigate the risk of contagion occurring;

(c) whether participants are assessing credible stress scenarios to understand how unexpected variations in market outcomes (eg, spot prices, generation capacity) could compound the liabilities incurred with counterparty risk. This checks whether risk management strategies are robust enough to manage the risk of a number of coinciding events (coincidence risk); and

(d) whether the level of reserves and available cash flow margins are set accordingly, taking (b) and (c) into account to confirm that the business can survive the impact of another market participant failing.

Impacts of systemic risk in the NEM

The failure of a large electricity business may lead to cascading effects in the electricity contract market for the reasons set out in this chapter. However, we do not consider that such failures would cause major instability to the overall financial system given the extent of the exposures the financial system has towards the NEM.

Therefore in this review, we refer to systemic risk as the risk of cascading failure within the NEM and not the broader financial system in Australia.

However, we also note that the effects of electricity businesses failing would not be contained within the electricity market and could have consequences for the wider economy. A cascading failure of multiple electricity businesses would be likely to cause significant disruptions to the Australian economy. For example, this could occur by affecting the ability of customers to access reliable and efficiently priced sources of electricity and damaging investor confidence in the Australian economy. This review will take into consideration potential impacts of financial contagion such as these.

The next chapter discusses the risks for retailers and generators operating in the NEM and explains how those risks are currently managed via the regulatory framework and internal risk management practices. Chapter four explores the issues surrounding the assessment of the materiality of systemic risk in the NEM.

2.1 Consultation questions

The Commission welcomes stakeholder views on the following:

Financial contagion and systemic risk

1. Are there other potential channels which have not been identified by this review?

3 Risks and risk management in the NEM

3.1 Risks faced by market participants

Energy businesses buying and selling electricity in the NEM are exposed to a variety of risks. Managing those risks is an integral part of a participant's day-to-day operations.

The categories of risk that participants are exposed to are wide-ranging and diverse. In discussions, participants have indicated that the main risks that they seek to manage are:

- settlement risk;
- market risk (spot price risk);
- credit risk (counterparty risk); and
- cash flow risk.

These are discussed in the following sections. Other risks include, for example, operational risk and regulatory risk.

3.1.1 Settlement risk

Retailers and generators buy and sell electricity in the NEM wholesale spot market, which is operated by AEMO. The NEM operates a gross pool, where all physical delivery of electricity is managed through the pool and it is compulsory for generators to sell their electricity into the wholesale market.

Retailers pay AEMO for the electricity their customers consume, and AEMO subsequently pays generators for the electricity they supply into the market. This settlement process occurs weekly about 33 days in arrears, which means payments for electricity bought are made four weeks in arrears. This creates a risk for generators that one or more retailers may be unable to pay their bill when the payment is due (settlement risk).

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. 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.[4] A participant must provide credit support to an amount that is at least equal to its maximum credit limit.

Participants also have a trading limit, which is currently set at 84% of their maximum credit limit. The margin between the credit and trading limits is designed to cover AEMO's potential liabilities during a seven day reaction period, representing the expected amount of time required to suspend a participant. Exceeding its trading limit would also require a participant to provide additional cash or credit support to AEMO.

4 From 28 November 2013, the 'reasonable worst case' methodology will be replaced by a new prudential standard, defining it as a 2% probability of incurring a loss or shortfall in the event of a participant default.

Market participants can reduce the required prudential credit support by the use of so-called reallocation arrangements. A reallocation arrangement is a financial arrangement between two market participants and AEMO with the objective of providing credit support relief to a market participant who has an existing off-market contract in place, such as an energy-delivery contract or a hedge contract. A reallocation arrangement allows the financial commitments existing under that off-market contract to be netted off against NEM spot market settlement without adversely affecting the prudential quality in the NEM.[5]

As noted in chapter two, we do not consider that the settlements process creates a significant risk of financial contagion, due to the existing prudential requirements administrated by AEMO.

3.1.2 Market risk

Retailers and generators that buy and sell electricity in the wholesale spot market are exposed to the risk of spot price volatility that characterises the NEM gross pool market. Because of the physical characteristics of electricity, which prevent it from being stored, and a need for continuous real-time matching of supply and demand, the prices are more volatile than in other commodity markets.

Retailers normally manage spot price risk on behalf of the majority of their consumers, by charging customers a price that shields them from direct exposure to spot price volatility. Spot price volatility can create significant risks for retailers. For example, just one hour at the current market price cap of $13,100/MWh could result in a large retailer incurring spot market liabilities of tens of millions of 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 does 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. Given the nature of the risks, there is a mutually beneficial financial relationship between retail and generation which allows both parties to better manage their risks. This financial dimension is a necessary and integral part of the functioning of the NEM as it allows market participants to manage spot price risk.

Participants use a myriad of instruments and strategies to hedge against spot price risk. The choice between various instruments is part of each participant's risk management strategy and depends upon the unique situation of each participant (see section 3.2).

The most commonly used instruments to hedge against market risks are 'derivative', or 'hedge', contracts. These contracts are called derivative contracts because their value is

5 A similar mechanism has been proposed for the future markets through a futures offset arrangement. This was discussed in AEMC, *Review into the role of hedging contracts in the existing NEM prudential framework, final report*, 27 July 2010.

linked to the underlying commodity price, in this case the wholesale electricity price. Such contracts create an off-setting payment or revenue stream that balances out the change in the spot price (therefore they are sometimes called 'contracts-for-difference'), in effect hedging the generator's or retailer's spot price exposure.

Electricity derivatives are needed to manage both price and volume risks. This is different to other common types of derivatives, such as interest rates and foreign exchange products, which are mostly used to manage price risk only. This distinct characteristic of electricity derivatives results in the development of specialised contracts which are specifically tailored to a retailer's volume patterns.

The ability of a retailer to adequately hedge its market risk will depend upon its ability to accurately forecast the profile of its customers demand, or to put in place hedge contracts that manage volume risk (ie, uncertain demand) as well as price risk. Accurately forecasting demand can be difficult, given factors such as weather variations and changing customer consumption behaviour. We note that the use of specialised weather-related risk management products has increased in recent years, as a means of managing weather-related risks.

Derivative contracts can be negotiated bilaterally ('over-the-counter', OTC) or traded on the futures exchange (ASX 24), as discussed further below.

Over-the-counter hedge contracts

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

There are three reasons why OTC electricity derivatives exist:

- they give participants who are hedging risk the ability to acquire customized contracts matching their unique risk profiles, including volume risk;
- they allow them to hedge without posting daily margins in exchange; and
- they allow participants to trade in contracts that either do not exist in exchanges or do not have enough liquidity on exchanges.

An OTC contract is a confidential agreement between the contract parties. OTC contracts are negotiated bilaterally but can be brokered by an intermediary. As there is no obligation to disclose the details of an OTC contract, the contract terms are only known to the counterparties to the contract. 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.

The most common types of OTC contracts that are available are explained in table 3.1. 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 out in box 3.1.

Table 3.1 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 3.1, 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. 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'.

Exchange traded futures and options

The ASX operates the ASX 24 platform, which offers all-day trading in derivative products, including futures, options and contracts-for-differences (CFDs). It covers a range of underlying asset classes, including electricity, allowing generators, retailers or other financial market participants to trade electricity derivatives. The derivatives are structured as cash-settled CFDs against the New South Wales, Victorian, Queensland and South Australian regional reference nodes in the NEM.

Many market participants do not trade directly on the ASX 24 futures exchange and instead make trades on the ASX 24 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 24 on behalf of the generator or retailer.

The following electricity derivatives are currently traded on the ASX 24 exchange:

- *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 period, which can be a quarter or a month.
  - Peak load futures, which only cover the period from 7:00am to 10:00pm on working weekdays in a quarter.
  - $300 cap futures, which 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).
- *Options over financial year strip futures:* This newly launched product provides protection against long term electricity price volatility with limited cash funding exposure.
- *Quarterly Average Rate (ie, Asian) Options:* This newly launched product provides an option over a base load quarterly futures contract.

Box 3.1: 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 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.[6] However, each party takes on a risk that the other party may be unable to meet its obligations under the OTC contract. This is a key source of the financial interdependencies between participants.

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.

3.1.3 Credit risk

Credit risk arises from the possibility of a participant's counterparty under a contract defaulting on its obligations under the contract. By entering into OTC hedge contracts, market participants are essentially replacing their exposure to market (price) risk by an exposure to the risk of their counterparties defaulting on their obligations under the contract (see section 3.2).

Participants have indicated they continuously assess the creditworthiness of their counterparties. In doing so, most participants appear to rely on a combination of their own desk top analysis into a counterparty's financial position and ratings from the major credit rating agencies, such as Standard & Poor's or Moody's, where they are available.

Participants generally use maximum counterparty credit limits to determine which level of exposure is appropriate for each counterparty, depending on a counterparty's creditworthiness. It also appears to be common among participants to halt or reduce trading with a particular counterparty when that counterparty's creditworthiness reduces.

Further, most participants appear to have policies in place to actively diversify the number of counterparties they have, in order to reduce risk from exposure to a single counterparty or small number of counterparties. Nonetheless, this may be challenging where there is significant concentration in the market.

It does not appear to be standard practice among participants in the NEM to exchange collateral for every OTC transaction they undertake as a safeguard in case a counterparty defaults on its obligations. Some participants have indicated they may require provision of credit support (for example, a parent group guarantee or bank guarantees) or collateral before entering into an agreement with a counterparty they consider to be of lower creditworthiness.

They may also have clauses in their contracts that trigger the requirement for provision of additional credit support if a counterparty's creditworthiness reduces. Typically, entities of lower creditworthiness would be required to offer collateral upfront and entities with a higher credit rating would only have to provide collateral in the event its credit rating drops or their credit worthiness weakens.

Therefore the majority of OTC transactions in the NEM tend to be uncollateralised. Participants have told us that this reflects the high costs of collateralisation, and relatively smaller exposures in the electricity market compared to other derivative markets. It also reflects a concern that requiring collateralisation may negatively affect the liquidity in the market, since it will place additional demands on scarce capital. Instead, credit risk is managed through restricting maturity limits[7] and transaction sizes with entities depending on their creditworthiness, in order to manage exposure.

3.1.4 Cash flow risk

Cash flow risk is the risk that a company's available cash will not be sufficient to meet its financial obligations, for example margin calls for ASX 24 traded contracts. Cash

7 The maturity limit is the period of time between entering a contract and its expiry date.

flow risk may arise or may be increased as the result of a misalignment in time or in magnitude between payments receivable and payments due.

Cash flow risk is different from liquidity risk. Liquidity risk arises when there is an insufficient number of parties actively participating in a given market to support willing buyers and sellers transacting their products at acceptable prices or, under certain circumstances, at all.

Liquidity risk can magnify cash flow risk, as a lack of liquidity in the market could limit a participant's ability to sell assets to support its cash flow position.

3.2 Trade-off between risks

Risk management by electricity market participants involves continuous trade-off decisions between degrees of exposure to various sources of risk. For example, a retailer typically seeks to reduce its exposure to spot market risk. It can do so by entering into OTC hedge contracts or on-exchange contracts.

The payment cycle of OTC electricity contracts is linked to the weekly NEM spot market settlement cycle, ie payments under an OTC contract occur on the same day as spot market payments. A payment owed by a generator to a retailer under an OTC contract for difference is therefore offset by spot market revenue that the generator receives on the same day. OTC contracts therefore expose participants to limited cash flow risk. There is, however, an increased credit risk, as participants are exposed to the risk of their counterparties defaulting on their obligations under the contract.

In contrast there is no direct financial relationship between generators and retailers when they buy and sell futures and options on the ASX 24. With centralised trade clearing, futures exchanges effectively remove counterparty credit risk by becoming the seller to every buyer and buyer to every seller, guaranteeing transactions. 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 ASX Clear (Futures), the clearing house operated by the ASX which acts as the central counterparty for all futures and options products traded on the ASX 24. The creditworthiness of the clearing house itself then becomes an important issue.

The ASX manages this credit risk by assessing the credit risk of each individual participant and assigning a credit obligation commensurate to the perceived level of counterparty risk. Accordingly, the ASX requires 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 be entitled to receive a variation margin payment, depending on daily price changes. The ASX will ensure that all member firms meet their fiduciary responsibilities and capitalisation requirements.

Given the price volatility in the NEM, the payments associated with the daily variation margins may be quite substantial, exposing participants to a potentially significant cash flow risk. Box 3.2 provides an example of the costs associated with these margins based on events in May 2007 when there was a period of prolonged drought. This shows a

significant cost pressure on a participant which would already be in a stressed situation due to the impact of the drought.

Box 3.2: Example of the impact of variation margins

In 2007, the contract market was very volatile due to supply constraints caused by the drought. This resulted in a substantial jump in the contract market multiple calendar years out. On 14 May 2007, base contract prices for the calendar year 2009 rose from $57 per MWh to $70 per MWh in less than a week. The off peak contract also jumped from $50 per MWh to $70 per MWh during the same period.

If a participant had, for example, aggregate 1000MW calendar 2009 contracts traded via the exchange, and assuming daily price changes averaged $3/day, the participant, would have to pay the exchange over $26m per day in variation margins ($3 * 1000MW * 8760h), for at least five days straight. The impact would be increased if the participant also had contracts for other calendar years.

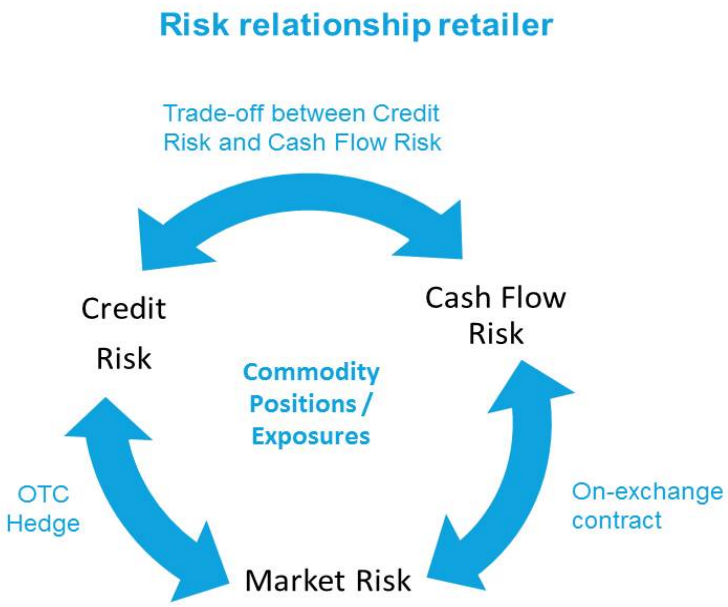
It has been suggested it may be possible to reduce the cash flow risk associated with variation margin payments under a regular swap contract by the use of option contracts. Options require less margining because the swing on an option premium is not as large as the swing on the strike price of the underlying swap contracts. Nonetheless, market participants have indicated that the option instruments currently offered on the exchange have limitations for use to effectively hedge a retail load profile, and that there is limited interest in the market for options. Also, options still require an upfront premium to be paid, and market participants have reported that this can be substantial.

Up until recently the only product for which options could be bought were flat calendar year. More recently, financial year options have appeared but again these are only for flat periods. Furthermore, as there are no options available on a quarterly basis, participants have indicated that they have difficulty managing seasonality through the exchange. In addition, there could be a lack of liquidity in some products for certain NEM regions.

In summary, a retailer entering into OTC contracts increases its exposure to credit risk, while the daily margin calls associated with on-exchange contracts can create cash flow risk. Credit risk limitations or cash flow limitations in turn may mean a participant may have to accept greater spot price risk exposure.

This trade-off is illustrated in figure 3.1.

Figure 3.1 Risk trade-off for a retailer



Source: Adapted from information provided by Energy Australia.

In their risk management strategies, participants seek to find the optimal balance between these risks, depending on what suits their individual situation best. These decisions are influenced by cost considerations and by the characteristics of various risk management instruments, as well as the risk preferences of the business and its available capital. Participants' hedging strategies will also change over time as circumstances change.

In our discussions with market participants, they have explained that they do not see OTC contracts and on-exchange contracts as substitutes. The choice is more complicated, and often these two types of hedges can be complementary. For example, a participant could manage the risk associated with an OTC contract through participating in a trade in the opposite position on the exchange.

3.2.1 Standardisation and the cost of carbon

Two characteristics that, according to market participants, influence the choice between OTC contracts and on-exchange contracts are the degree of standardisation and the treatment of carbon costs.

Degree of standardisation

In order to be traded on the ASX 24, electricity futures and options contracts have to be standardised to a sufficient degree. Standardised contracts have the same quality, quantity, delivery time and location.

OTC contracts can be relatively standardised, especially those which are brokered by an intermediary, or more bespoke and tailored to the particular needs of the counterparties.

The risk management needs of a retailer managing spot price risk will depend primarily on its load profile and on seasonal weather conditions. For example, large industrial users typically have a flat load, while residential customers have a more variable load during the day, with 'peaky' periods in the morning and in the afternoon and evening. The peakiness is in turn influenced by seasonal weather conditions, with hot summer days leading to an increased use of electricity through the use of air conditioning.

A retailer serving both residential and commercial customers (eg, shopping centres, offices) may therefore have a unique load profile – and hence relatively bespoke hedging needs. It may use a number of different contracts - baseload contracts, peak contracts, or cap contracts - to match its hedging needs, or it may choose to enter in a tailored 'load-following' hedge.

Market participants have indicated this explains why OTC derivatives will continue to play an important role in managing risks in the NEM. Some participants have said they would not be able to manage their risk adequately without OTC contracts.

In response to industry demand, the ASX has recently expanded its range of electricity products, with monthly futures (available since July 2013) and quarterly average rate options. This expansion of products could assist market participants in better managing their hedging needs using on-exchange products, although it is too early to comment on how participants will decide how to use such options to manage their risks.

The inclusion of a carbon cost component

In 2012 a price on carbon was introduced, set at $23 a tonne at the time of introduction. It has been the subject of policy uncertainty since that time. Market participants - especially generators that are required to pay the carbon price - have sought to manage the price risk associated with the introduction of a price on carbon.

In on-exchange derivative contracts, a carbon component is included in the price of the product. This component has a fixed price for carbon for the duration of the contract, and hence cannot be adjusted if the price of carbon changes during the lifetime of the contract. This creates the risk that the actual price of carbon is not reflected in the contract, depending on any changes to the carbon price during the contract duration.

For OTC contracts, the Australian Financial Markets Association (AFMA) has developed a carbon pass-through clause. This clause automatically adjusts the price component for carbon to any changes to the carbon price. Carbon price risk is therefore fully integrated in the OTC contract and fully passed on to the counterparty of the contract.

3.2.2 Vertical integration and horizontal diversification

One trend in the last decade has been for participants to manage more risk internally through vertical integration, by owning both generation and retail assets. These businesses are commonly referred to as "gentailers". Vertical integration provides the company with a 'natural' internal hedge against spot price risks as generation and retail have complementary risk profiles, at least to the extent that it has a matching level and pattern of generation and retail demand.

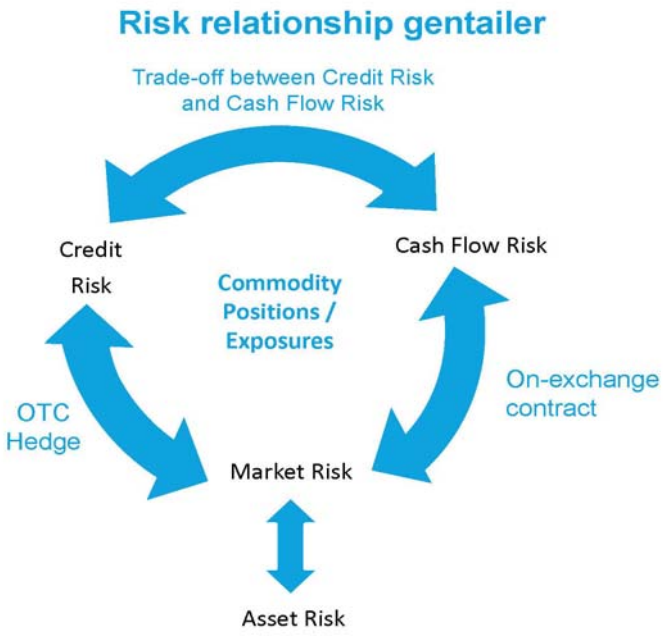
No vertically integrated company will be 100% internally hedged - participants may be 'long' in generation (ie, they have more generation output than retail load) or 'long' in

retail (vice versa). This means they will still have to externally manage the risk for the part they are 'long', or decide to be exposed to the spot market for this part. This is also the case when the generation and retail assets are located in different NEM regions, or if the nature of their generation does not fully match the nature of their retail demand (eg, peak versus non-peak).

Vertical integration also introduces a degree of asset risk in the 'risk mix'. Asset risk arises from the possibility of operational malfunction of generation units, which could reduce their output. This would decrease the effectiveness of the internal hedge, and would leave the business exposed to spot market risk for the generation it requires to meet its load.

A gentailer's risk relationships could therefore be illustrated as follows:

Figure 3.2 Risk trade-offs for a gentailer



Source: Adapted from information provided by Energy Australia.

Many energy businesses are also horizontally diversified, in that they are involved in activities outside the electricity market. For example, market participants may participate in the gas market, LNG developments, other commodity markets, and so on. Market participants have indicated that this means that risk and revenue management in the NEM is not isolated from other activities.

A market participant owning both gas and electricity assets may, for example, choose to use its gas to increase the output of its electricity generation when the prices on the electricity market are high, instead of selling the gas on the gas market. In doing so, it may then have to buy additional gas on the gas market in order to meet its obligations under gas supply contracts.

Gas markets and electricity markets are inter-related. This has implications for risk management practices as participants consider risks and risk management collectively across all of their activities.

3.2.3 The level of OTC and exchange traded derivatives

Comprehensive information on the volume of OTC derivatives trading is not currently available, since there is no requirement to report this information. AFMA publishes an annual report on Australian financial markets, but the data on electricity OTCs is based on a survey and its accuracy has been questioned by some market participants, given that responding to the survey is voluntary.[8] In particular, it has been suggested that the level of OTCs is understated because significant market participants have not responded to the survey. The rate of response (in terms of number of participants) also varies from one year to another, complicating comparisons between years.

AFMA has published the following diagram of the annual volume of on-exchange (SFE) and OTC derivatives since 2002.

Figure 3.3 Turnover of OTC vs on-exchange in electricity derivatives

AFMA, *2013 Australian Financial Markets Report*, p49.

Figure 3.3 suggests that, until 2006-2007, the majority of electricity derivatives used were OTC derivative contracts. Since then, the futures market in electricity derivatives has matured, with consequent growth in volume. In part, this development was propelled by the global financial crisis and in part also by increased liquidity in the futures market. The AFMA data suggest that exchange-traded derivatives accounted for the majority of total traded volume in recent years, though this can be expected to understate the proportion of OTC derivatives because of the likelihood that the AFMA survey response was incomplete.

The figure shows a drop in overall volume of electricity derivatives between 2010-2011 and 2011-2012. AFMA suggest this might be explained by the withdrawal of several investment banks from the electricity market - thereby reducing liquidity - and by a relatively mild summer across the NEM, which put downward pressure on prices and

8 AFMA, *2013 Australian Financial Markets Report*.

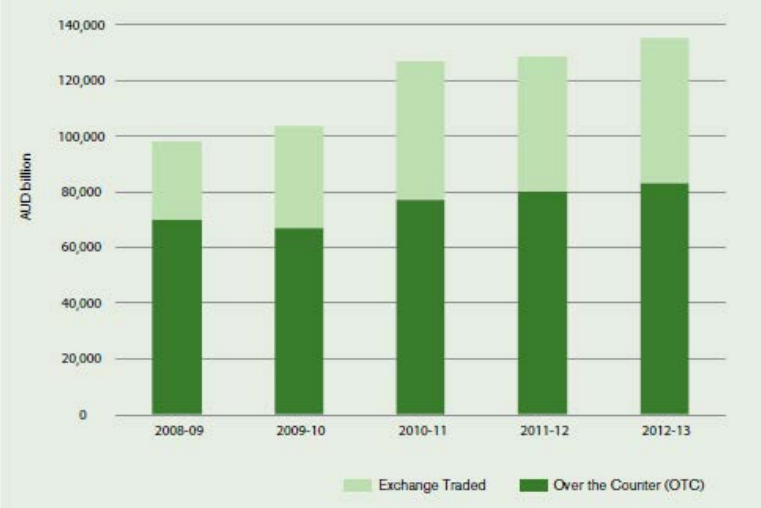
reduced volatility.[9] Increased internal hedging through vertical integration may have also contributed to this trend.

In 2012-2013, trade in OTC electricity contracts reported in the survey totalled roughly 291 million MWhs, accounting for 46% of total traded volume in electricity derivatives, while trade in on-exchange electricity products totalled roughly 342 million MWhs, accounting for 54%. In 2011-2012, reported OTC trade accounted for roughly 35% of total traded volume in electricity derivatives, while on-exchange trade accounted for 65%.

This means there has been an increase by 28% in the use of OTC contracts versus on-exchange contracts in 2012-2013 compared to 2011-2012. The growth in OTCs in 2012-2013 compared to the previous year could be explained by ongoing policy uncertainty surrounding the carbon price. Some market participants have indicated this uncertainty has caused them to favour the use of the flexible carbon pass through clause in OTC contracts over the fixed carbon price component in on-exchange contracts.

Reported OTC trade accounted for 62% of total traded volume in 2012-2013. This number was similar in 2010-2011 and 2011-2012, as can be seen in Figure 3.4.

Figure 3.4 Total annual turnover by market



AFMA, *2013 Australian Financial Markets Report*, p7.

Compared to this number, the proportion of reported OTC trade in total traded volume of electricity derivatives is below the average over the past five years.

It is also noteworthy that the increase in traded volume in reported OTC contracts in 2012-2013 has been caused by increased trade among generators and retailers. According to the data, OTC trade by generators increased by 177% compared to 2011-2012 and OTC trade by retailers 94% compared to 2011-2012. In contrast, the traded volume in reported OTC contracts by intermediaries such as banks fell by 75% compared to 2011-2012. Trade by financial intermediaries has been decreasing over recent years and only made up 9.5% of total trade in electricity derivatives in 2012-2013.[10]

9 AFMA, *2012 Australian Financial Markets Report*, p50.

10 AFMA, *2013 Australian Financial Markets Report*, p50

Trade varied significantly between NEM regions. As can be seen from the diagram below, New South Wales and Queensland have been the most active markets for the past two years.

Figure 3.5 Annual turnover in electricity derivatives by NEM region

AFMA, *2013 Australian Financial Markets Report*, p49.

The total traded volume in electricity derivatives amounted to almost 633 million MWhs. In view of the total NEM system demand (roughly 184 million MWhs), this meant that the liquidity ratio for 2012-2013 (the total traded volume compared to the total NEM system demand) was 3.4. This liquidity ratio is almost the same as in 2011-2012 (3.5).

As will be discussed further in chapter four, the overwhelming majority of trade is conducted by the top eight respondents to the survey - accounting for 92% of total traded volume. Within this, the top four respondents accounted for almost 70% of the reported traded volume.[11]

3.2.4 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.

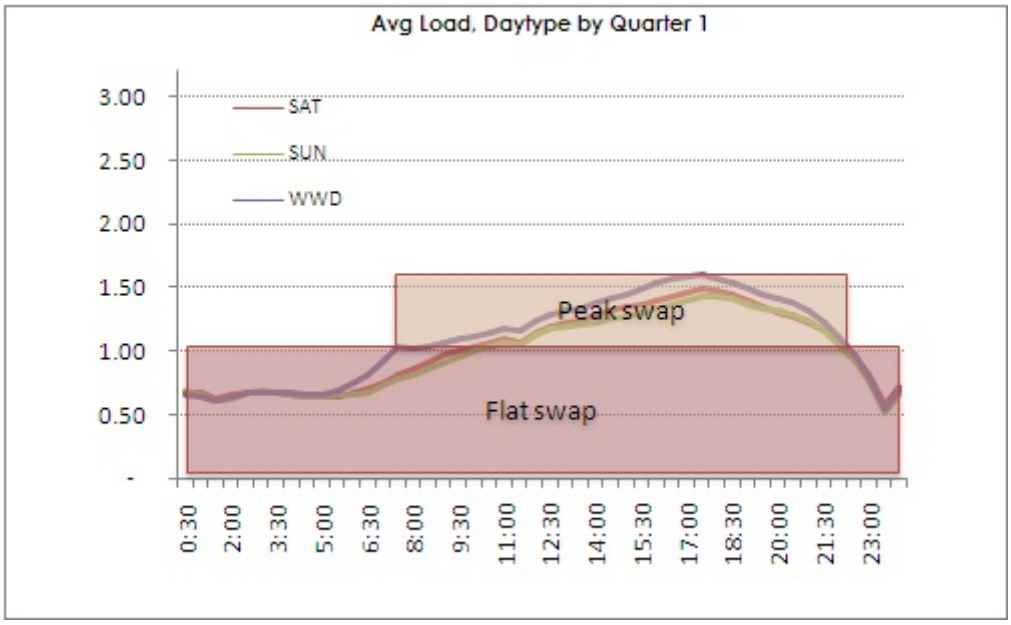
An example of how a typical retailer may use OTC contracts and other products to manage spot price volatility is set out below. The diagrams below show the process that a retailer may go through to build up a hedge portfolio to manage its forecast customer demand.

Figure 3.6 shows the average daily load profile for a hypothetical retailer, for quarter 1 (January to March), with different load profiles for working week days (WWD), Saturday and Sunday. The numbers on the vertical axis refer to load volume, while the hours of the day are set out on the horizontal axis. These average load profiles can be broken into two components - the peak period and the flat period. The retailer's

11 We note that for the 20113 AFMA survey a number of large market participants did not respond to that survey, including Energy Australia, Alinta Energy, Stanwell and Hydro Tasmania.

demand in each of these periods could be hedged using an OTC swap, as illustrated below in figure 3.6. The retailer could also use ASX 24 base load futures and peak load futures to achieve a similar result.

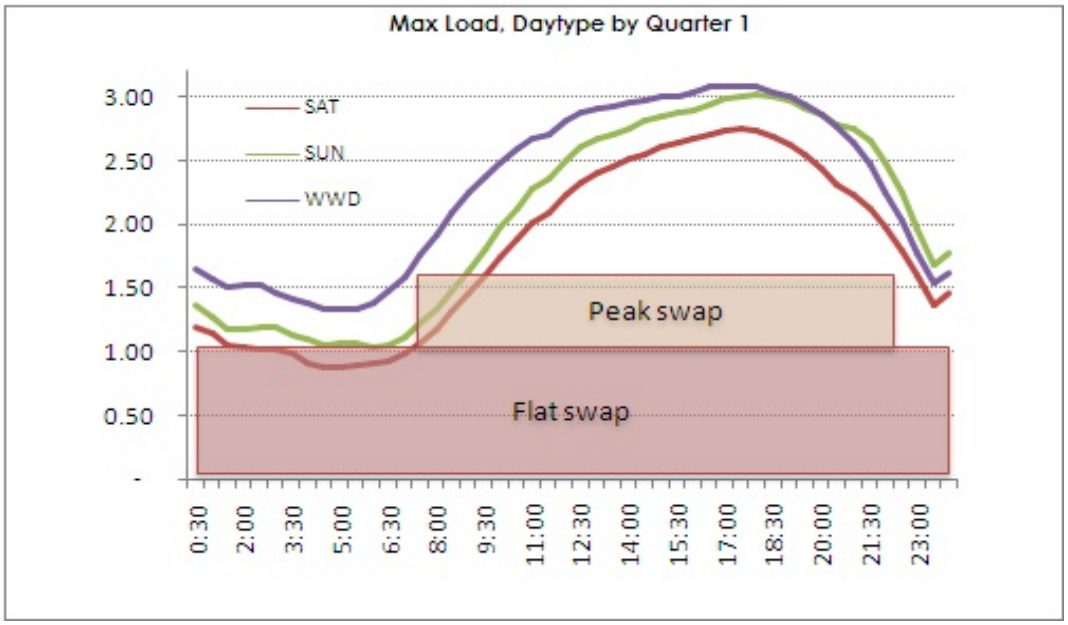
Figure 3.6 Swap coverage for retailer's average load



However, this figure illustrates that using standard-sized swaps can result 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.

In addition, these standard products do not capture the 'flex' period - the period where load reaches maximum demand. Expected maximum load for quarter 1 is illustrated in figure 3.7 below. The difference between these figures is that the first relates to average daily load, and the second is differences in the actual daily load over the period. 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.

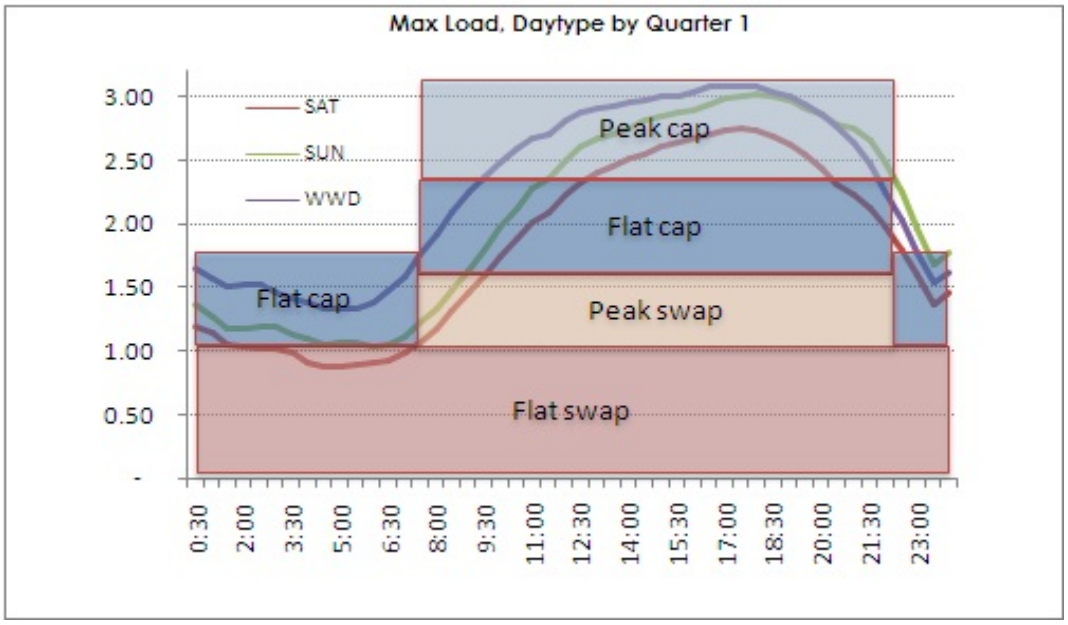
Figure 3.7 Retailer's maximum load



As can be seen from figures 3.6 and 3.7, 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 3.8. These caps could be OTC cap contracts or ASX 24 $300 cap futures.

Figure 3.8 Cap contract coverage for retailer's maximum load



As an alternative to cap contracts, a vertically integrated operator - that has generation assets as well as retail customers - may use peaking generation to provide cover for its maximum demand.

Major retailers 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 a certain temperature) or, in the case of a vertically integrated operator, the failure of a generating unit.

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 require with other market participants.

3.3 Risk management - internal and external requirements

Risk management by market participants takes place within a framework set by internal company policies and external risk management obligations, which will be discussed below.

Within this overall risk management framework, an individual company then develops strategies to manage various risks on a daily basis, depending on its specific needs and its risk profile.

3.3.1 Internal risk management policies

In discussions with the AEMC, all interviewed electricity businesses have indicated they have internal risk management frameworks approved by their boards of directors, that determine overall risk management parameters. These include the business's 'risk appetite', trading limits and counterparty credit limits.

Typically, risk committees established under a participant's board of directors are responsible for day-to-day internal risk management oversight. Oversight functions are supported by internal reporting policies.

Further, a number of participants have indicated it is 'industry best practice' to segregate trading, middle office and back office functions within the company. The trading of financial products is undertaken by the 'front office', while the middle office ensures the control and processing of transactions. The 'back office' includes the administrative functions that support trading, such as record keeping, trade settlement and regulatory compliance.

Standard risk management practices also appear to include the testing of financial resilience under a number of stress scenarios, and measuring financial exposures through Value-at-Risk methodologies.

Box 3.3: Value-at-Risk methodologies

There are strong ties between the commodity risk management methodologies of banks and energy companies. The mark-to-market principles that govern exposure valuation at banks, also underpin the risk management approach of energy companies.[12] Value at Risk (VaR), a measure of potential deviation in mark-to-market value, has also been adopted as the main measure to manage the risk associated with energy activities.

VaR is a statistical technique used to measure and quantify the level of financial risk within a business or investment portfolio over a specific time frame. VaR is measured in three variables: the amount of potential loss, the probability of that amount of loss, and the time frame.

The purpose of risk management is to ensure that risks are not taken beyond the level at which the business can absorb the losses of a probable worst outcome. VaR measures give the business a useful method to measure and control the level of risk it undertakes.

Applying VaR measures in the energy sector raises specific challenges. The effectiveness of these measures depends upon their ability to accurately quantify the value of the energy-related transaction. In the example of a hedge trade, the high level of volatility in the electricity spot market makes this difficult, and therefore some estimation method to forecast future prices is needed. Also, the effectiveness of value-at-risk depends upon the ability to liquidate the transaction when the loss event occurs. However, the specific and unique nature of some energy transactions may limit this ability.

In energy businesses, VaR is typically accompanied by a broader risk measure focused on the potential deviation in portfolio 'earnings' over a reporting horizon. This earnings at risk (EaR) measure goes by different names depending on the earnings measure chosen, profit at risk (PaR) and cashflow at risk (CFaR) being two common alternatives. But all these methodologies share a common goal. That is to measure the risk associated with structural physical asset exposures that cannot easily be closed out, for example from power plants, hedge contracts and customer portfolios.

EaR measurement is more diagnostic, focused on understanding the complex interaction between physical assets and hedges under different market outcomes. Hedging may be internal through purchasing generation or external in the derivative market. Understanding the risks with such a portfolio on a scenario basis is difficult. But an effective EaR framework provides an insight into the interaction between customer contract prices, hedge profiles, movements in underlying commodity markets and load uncertainty. However for these measures, there are no widely accepted definitions and common rules.

12 Marking-to-market is the practice of updating the value of an asset or a liability to estimate and monitor its current market value rather than the initial cost of the asset or liability, in order to assess current exposures under their contracts.

3.3.2 External risk management obligations

External obligations arise from a number of different sources, including::

- APRA prudential requirements;
- regulatory requirements associated with holding an AFS license;
- ASX Corporate Governance Principles (for those participants listed on the exchange);
- debt covenants underlying a financing agreement with a financial institution; and
- NEM prudential requirements administered by AEMO; and
- Australian accounting standards relating to the valuation of electricity derivatives

Further, certain reporting and transparency requirements arise from accounting rules.

APRA prudential requirements

The Australian Prudential Regulation Authority (APRA) is the prudential regulator of the Australian financial services sector. It oversees banks, credit unions, building societies, general insurance and reinsurance companies, life insurance, friendly societies, and most superannuation providers.

Financial services providers are subject to certain capital adequacy requirements arising from the so-called Basel II and Basel III accords. APRA oversees the application of the capital adequacy requirements in Australia.

Banks such as Westpac and Macquarie Bank, which are active participants in the electricity financial market, are under APRA prudential regulation. The retail and generation electricity businesses are not covered by APRA requirements.

Requirements to hold an AFS licences

The Corporations Act 2001 (Cth) requires entities dealing in OTC electricity derivatives, such as generators and retailers, to hold an Australian Financial Services Licence (AFSL). Management of this licence requirement is the responsibility of the Australian Securities and Investments Commission (ASIC).

ASIC has the function of monitoring and promoting market integrity and consumer protection in relation to the Australian financial system. To that end, ASIC oversees compliance with a number of laws and regulations such as the Corporations Act 2001 (Cth).

ASIC has a number of regulatory and enforcement powers to perform its role, including the power to:

- (de)register companies;
- make rules aimed at ensuring the integrity of financial markets;
- investigate suspected breaches of the law; and
- issue infringement notices in relation to alleged breaches of some laws.

ASIC assesses applications for AFS licences as part of its role as regulator of the financial services industry. ASIC notes that "as the financial services regulator, we license and monitor financial services businesses to ensure that they operate efficiently,

honestly and fairly".[13] 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 and has sufficient financial resources to carry on the proposed business. ASIC is required to issue an AFSL to an applicant unless ASIC can demonstrate good reason for refusing the licence.

ASIC has issued a number of relevant regulatory guides which explain how the AFSL regime should be implemented, in particular RG166 and RG104.[14]

ASIC issued RG 104 in 2007 to provide guidance for AFSL holders for meeting their general licensing obligations. Specifically, RG104 states that ASIC expects AFSL holders to have structured and systematic processes in place for identifying, evaluating and managing risks.[15]

RG 166 outlines financial requirements that a business needs to meet as an AFSL holder.

Box 3.4: RG166 - summary

Particular among the RG166 requirements are:

- Risk management systems must address risk to financial resources;
- Positive net assets, and sufficient cash resources to cover the next 3 months; and
- Required surplus liquid funds.

Under RG 166, electricity derivative market participants who hold an AFSL are generally subject to two levels of financial requirements.

These are:

- the base level requirements of cash flow and balance sheet solvency and the cash needs requirement (see Section B of RG 166); and
- because licensees incur actual or contingent liabilities by dealing or making a market in derivatives, the requirement to hold adjusted surplus liquid funds (ASLF) equal to the sum of:

  (i) $50,000; plus

  (ii) 5% of adjusted liabilities between $1 million and $100 million; plus

  (iii) 0.5% of adjusted liabilities for any amount of adjusted liabilities exceeding $100 million, to a maximum requirement of $100 million in ASLF.

Participants are also required to prepare a three month forward looking cash flow analysis, which would be updated every quarter.

13 See http://www.asic.gov.au/asic/asic.nsf/byheadline/Our+role?openDocument

14 ASIC's regulatory guidelines are available online at http://www.asic.gov.au/asic/asic.nsf/byheadline/Regulatory+guides?openDocument.

15 ASIC suggests that AFSL holders use AS/NZS 4360:2004 Risk Management Systems for guidance. Since the publication of RG 104, AS/NZS ISO31000-2009 Risk Management has replaced the AS/NZS 4360:2004 Risk Management Systems standard mentioned in RG104.

Energy businesses which hold an AFS licence are required to comply with specified financial capacity measures and to have in place systems to manage these capacity requirements. ASIC has noted that it is not a prudential regulator and its financial requirements do not seek to prevent AFS licensees from becoming insolvent or failing due to poor business models or cash flow problems.[16] Nonetheless, ASIC note that:

"We set minimum financial requirements to promote appropriate financial risk management, taking into account the nature, scale and complexity of an AFS licensee's business. While our requirements are not aimed at preventing licensee failure, they are intended to help ensure that cash shortfalls do not put compliance with the licensee's obligations at risk".[17]

ASIC's functions relating to market integrity and consumer protection require ASIC to ensure companies have the financial and corporate ability to implement their compliance functions and meet their legal obligations, but not to ensure that companies will never fail. While the AEMC's review aligns in some respects with ASIC's focus - for example the AEMC review is not focused on measures to prevent individual companies failing- it is important to recognise that ASIC's functions differ somewhat from the focus of this review, where the AEMC has been asked to assess the materiality of systemic risk occurring in the electricity market, and whether current mechanisms to mitigate that risk are adequate.

Consistent with its functions, ASIC has the ability to impose additional risk management requirements on electricity market participants who hold an AFS licence. ASIC published a consultation paper (CP 177) in May 2012, specifically considering the financial requirements that should apply to electricity derivative market participants. CP 177 envisaged increasing the financial requirements on electricity market participants. Following submissions to the consultation, ASIC stated in Report 320 that it had decided not to proceed with its proposals.

Box 3.5: ASIC Report 320 - summary[18]

In its consultation paper 177, ASIC proposed a number of amendments to current financial obligations on electricity market participants that hold AFS licences[19]. 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;
- hold net tangible assets equal to the greater of:

16 See ASIC, *Consultation paper 177, Electricity derivative market participants: financial requirements*, May 2012, p8.

17 ASIC, *Report 320 Response to Submissions on CP 177 electricity derivative market participants: financial requirements*, December 2012, p5.

18 ASIC, *Report 320 Response to Submissions on CP 177 electricity derivative market participants: financial requirements*, December 2012.

19 ASIC, *Consultation paper 177, Electricity derivative market participants: financial requirements*, May 2012.

- $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.

In its report 320, ASIC concluded that:

"After considering the feedback we received in submissions, we do not believe that the approach proposed in CP 177 is the best way to ensure electricity derivative market participants address the risks on which our financial requirements for AFS licensees are focused. Therefore, we do not intend to implement the proposed revenue-based net tangible assets and liquidity requirements."

"We {ASIC} remain concerned about how electricity derivative market participants are managing risk".

"We {ASIC} think new requirements specifically aimed at improving risk management practices for electricity derivative transactions would greatly benefit the OTC electricity derivative market. Some of these new requirements may be applied through the implementation in Australia of reforms to OTC derivative markets proposed by the G20. If electricity derivatives are ultimately not included in these reforms, we will consult on adapting components of these new requirements that we consider address specific issues in the OTC electricity derivative markets through the AFS licensee financial requirements."

"Counterparty risk in the OTC electricity derivative market may be intensified by some distinctive characteristics of this market. These include:

(a) the concentration of the market, and interdependency of key players— just over 90% of OTC market trading in electricity derivatives is engaged in by eight entities, and over 70% of trading by the three most significant entities; and

(b) the lack of bank intermediation in the OTC derivative market—data gathered in a recent survey of electricity derivative market participants indicated about 25% of electricity derivatives were traded with banks and financial institutions, while the bulk were traded among generators and retailers (74%)."

"We propose to wait until the implementation of the G20 reforms in Australia is more settled before completing our review of financial requirements for electricity derivative market participants. In particular, the AEMC is currently consulting on the resilience of the financial relationships and markets that underpin the operation of the National Electricity Market (NEM)."

ASX Corporate Governance Principles

Companies listed on the ASX make commitments to comply with the ASX listing rules. Under these rules, ASX listed entities are required to benchmark their corporate governance practices against corporate governance principles prepared by the ASX

Corporate Governance Council.[20] These corporate governance principles include a principle to 'recognise and manage risk'.[21]

Listed entities are further required under the listing rules to identify where they do not conform, to disclose that fact and the reasons why. This gives a listed entity the flexibility to adopt alternative corporate governance practices, if its board considers those to be more suitable to its particular circumstances, subject to the requirement for the board to explain its reasons for adopting those alternative practices.

The ASX has the option of suspending companies from trading if they breach the listing rules.

Obligations arising from debt covenants underlying a financing agreement

Banks and other debt providers lending funds to the market participant typically include certain risk management requirements in the debt covenants underlying a financial agreement. This may include the requirement for a market participant to cover a minimum percentage of its exposure with hedge contracts. It typically also includes a number of financial bandwidths ('ratios') which can determine, for example, that a company must hold certain liquid assets against the outstanding loan.

Accounting standards for valuing electricity derivative contracts

How an electricity participant values its derivative contracts for accounting purposes could influence other participants' perception of its creditworthiness and risks. Therefore from the perspective of this review, understanding the accounting standards governing electricity derivative contracts is useful in assessing the financial resilience of the NEM.

The key accounting standard is AAS/IAS 39 which deals with hedge accounting. That is, accounting for derivative positions that are held to offset some other specific risk which is a key part of the business, rather than speculative trading. The basic principle in this standard is that all derivatives are carried at fair value with gains and losses in the income statement of the participants' accounts. The fair value of a financial asset or liability is the amount for which the financial asset could be exchanged, or the financial liability settled, between knowledgeable, willing parties in an arm's length transaction.

However, derivative contracts are by their nature subject to difficulties in valuation of their fair value. Difficulties arise in particular because the value may depend on a time series of future prices or events which may extend many years into the future, and which may not itself be subject to readily tractable statistical properties.[22]

Estimating the fair value of an OTC electricity derivative contract is therefore dependent upon the participants' ability to estimate future payments under the contract, using their mark-to-market valuation techniques. This could also result in

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20 See ASX Listing Rule 4.10.3.

21 Principle 7: Recognise and Manage Risk - *Guide for small-mid market capitalised companies*, ASX Corporate Governance Council.

22 Difficulties also arise where the nature of the contract blurs distinctions between "goods and services" and "financial derivatives" - for example, the retail sale of electricity to consumers can be characterised in either of these ways, and this has led to accounting and regulatory issues in the past.

variations in practice across the industry in how OTC contracts are valued, as there are no specific requirements on the manner or frequency with which marking-to-market is required.

In principle, determining the fair value of OTC contracts would include a reflection of the contract's credit quality under the AAS/IAS 39 standard. For example, this could include a probability of default when valuing a contract. We also note that the Basel III capital reforms include a reporting obligation to make either a credit value adjustment or debit value adjustment based upon probability of default in accounts.[23]It is not clear to what extent this is current practice of electricity participants.

In practice, these issues could mean that the balance sheet of an electricity market participant does not sufficiently inform upon the actual value of the business based upon its OTC contracts. Also nor are balance sheets between participants necessarily comparable since they may apply different assumptions about calculating fair value and which contracts are in or out of the hedge accounting standards or other accounting standards.

We value stakeholder views on whether there is merit in exploring the accounting standards for OTC contracts as part of this review.

3.4 Consultation questions

The Commission welcomes stakeholder views on the following:

Overview of risks and risk management in the NEM

2. Please provide any additional comments you may have on the description of risks and risk management in this chapter.

3. Do you consider there is merit in the Commission exploring the accounting standards for OTC contracts as part of this review?

23 The Basel process has broadly been implemented to allow individual entities and industries to develop internal models that meet the Basel III accord risk weighting requirements, and then have these put through an "acceptance process" by the prudential regulator, rather than having the regulator attempting to be precise as to how the risk analysis on various asset classes is to be performed.

4 Measuring the materiality of systemic risk

Under the terms of reference for this review, the AEMC is to provide advice on risks to financial stability in the NEM arising from financial interdependencies between market participants, and the impacts of those risks if they materialise and result in financial instability.

One issue is how to best measure the materiality of systemic risk in the NEM caused by the financial interconnectedness of market participants. In this context, it is recognised that not every market participant's default will result in financial contagion and not every risk, if materialised, would result in financial instability. The AEMC is primarily concerned with those risks that have the potential to lead to further financial contagion and financial instability.

Assessing or quantifying the magnitude of that risk is not straightforward - there does not appear to be one, clear measure that could be used for this purpose. A review of multiple indicators relating to OTC activity and the businesses' internal risk management practices will be needed to properly understand the materiality of systemic risk. Also the potential for systemic risk in the NEM will depend on the actual behaviour of market participants both before and during any event involving counterparty default. This could be difficult to predict.

Furthermore, there is a danger in solely relying on current trading data as trading activity may change over time. Hence this review needs to apply a longer term perspective.

This section discusses some of the indicators that could provide a basis for assessing the materiality of systemic risk in the NEM.

It is sometimes suggested that the fact that the aggregate turnover in OTC contracts exceeds total underlying demand reflects a degree of speculation in the market rather than hedging of physical positions.[24] This assumes that the more total volume in OTC contracts exceeds total underlying demand, the more businesses are speculating without any underlying physical assets, and therefore taking on more risk. This view may be mistaken for the following reasons:

- the extent of hedging required depends upon customer load profiles. Participants are constantly changing their positions over time to adapt to changing circumstances;
- the value of the original hedge and the 'counter-hedge' are both included; and
- retailers need to hedge both total volume and peak demand of consumer load. If a retailer only hedges to the level of the average daily consumption of its customers, the retailer will be exposed to the spot price when the consumption increases above the average. This was discussed in section 3.2.4.

Such a view also suggests that 'hedging' and 'speculation' can always be distinguished and that 'speculation' increases risk in the market. The primary purpose of hedging is to

[24] According to AFMA data, the total NEM demand in 2012-2013 for example was 183,727,278 MWhs, while the total turnover of OTC contracts in the same period was 291,179,122 MWhs, a ratio of OTC turnover to demand of almost 1.6. See AFMA, *2013 Australian Financial Markets Report*, p50.

offset another, pre-existing risk, arising for example from price or volume movements in a commodity market such as electricity. Speculation on the other hand does not seek to offset a pre-existing risk but attempts to profit from fluctuations in the market value of the underlying derivative.

In practice, the distinction between 'hedging' and 'speculation' can be difficult to make. For example, a 'hedging' participant may lock in a future position assuming a given level of consumer demand. However, this assumed demand may not eventuate, leading to an exposed position. It is very difficult in hindsight to determine if the demand forecasts used were 'speculative' or simply inaccurate.

Furthermore, speculative trading does not necessarily increase risk in the market, as speculative trading also increases liquidity and facilitates price discovery. Some participants have indicated that they occasionally may engage in some marginal speculative trade for commercial reasons. An example of this would be to test the contract market for price discovery. Participants have told us that this is a very limited part of their overall financial activities, both in terms of volume and dollar value.

A higher turnover of contracts may therefore be an indication of liquidity and active risk management.

Information about the use of OTC derivatives compared to on-exchange derivatives by market participants may also provide useful information about the trends in risk management strategies of electricity businesses.

It is however unlikely that firm conclusions about the risk of financial contagion could be drawn on that basis alone. Both products appear to fulfil complementary roles in managing market risks by participants. Information that, for example, the use of exchange-traded derivatives has grown at the expense of OTC derivatives therefore does not necessarily mean that overall risk has decreased if this means that, for example, exposure to market risk has also increased. Conversely, an increase in the use of OTC derivatives does not necessarily mean overall risk has increased.

ASIC has suggested that trade with intermediaries in the electricity derivatives market tends to improve credit quality as banks are subject to more stringent risk management requirements.[25] It is hard to get accurate data on the proportion of contracts traded via financial intermediaries.

The AFMA 2013 Financial Markets Report reported that bank intermediary proportion of OTC electricity contracts fell to under 10% in the financial year 2011-2012, which represents a fall from 17% in the previous year. The reasons behind this decrease in intermediary activity suggest that this may not be a temporary occurrence. They include:

- following the GFC, banks have rationalised their operations in response to more stringent capital regulations; and
- vertical integration which has affected liquidity in the contract market and thus reduced profit opportunities for intermediaries.

25 ASIC, *Report 320, Response to submissions on CP 177 electricity derivative market participants: financial reporting*, December 2012, p13.

To understand the level of systemic risk in the NEM, this type of information needs to be complemented by information about other indicators such as:

- the degree of concentration in the market;
- the value of open OTC positions[26];
- a business's available reserves and cash flow in order to absorb any losses; and
- the quality of the underlying credit and the use of collateral or other measures to reduce credit risk.

A high degree of concentration in the wholesale market as well as in the contract market, in combination with large negative open positions could increase systemic risk, as it is likely the effects of the default of a (large) counterparty in terms of further financial contagion will be more severe in a highly concentrated market.

It is not clear to what extent the big three gentailers are interconnected to one another through their hedging arrangements, as such data are not published. The impact of a default of any large gentailer will be exacerbated in the absence of credit support, collateral or other measures to reduce credit risk.

Degree of concentration in the market

As noted previously, comprehensive data on OTC contract activity in the electricity sector are not available because there is no reporting obligation. AFMA's data suggest that the top respondent to their survey has a market share of 36.3% in overall trading, the top three respondents have an almost 60% share, and the top eight participants 92%.

We welcome stakeholders' views on whether the AFMA data are an accurate reflection of the concentration of trading in the electricity OTC market.

Figure 4.1 Electricity trading concentration in the OTC contract market

ELECTRICITY TRADING CONCENTRATION

Market Rank	% Market Share	% Cumulative Share
1	36.3	36.3
2	11.2	47.5
3	11.1	58.6
4	10.9	69.5
5	7.7	77.2
6	6.0	83.1
7	4.7	87.9
8	4.2	92.0

Top 8 Respondents	% Market Share
2008-09	82.5
2009-10	79.2
2010-11	90.9
2011-12	91.1
2012-13	**92.0**

Source: AFMA, *2013 Australian Financial Markets Report*, p51.

26 The value of open OTC positions means the value of OTC contracts that have not been settled.

The value of open OTC positions

For the purposes of assessing the level of systemic risk, the value of open OTC positions held by each participant would be measured on a gross basis, as information on overall aggregate net positions may underestimate the degree of credit risk in the market.[27]

The value of open gross positions could then be assessed against the financial requirements under an AFS licence (see Box 3.4) or the participant's available funds, in order to understand whether default of a participant could lead to significant financial stress. Large negative open positions, occurring on a consistent basis, rather than being a one-off, may trigger greater concern.

Degree of collateralisation

As mentioned in section 3.1.3, the majority of OTC transactions in the NEM are uncollateralised. Given the size of the OTC market, on a whole-of-market basis, exposures under these uncollateralised contracts are likely to be significant.

However, information about the degree of collateralisation should be approached with some caution. This is because, due to the nature of electricity OTC contracts, there will be a physical asset behind each trading position. A generator will have its generating units and a retailer will have its portfolio of customers. To the extent that there is value to these physical assets, then the lack of collateralisation in the market is less likely to give rise to systemic risk. This is because the continued operation of the generation assets and/or customers purchasing electricity will help to minimise coincidence risk.

Following an OTC contract default with a counterparty, either a generator or a retailer could be able to enter into similar contracts with other counterparties. Hence the cost of replacing those original contracts could be spread over the duration of the initial contract.

Also, the overall impact of a counterparty default on a business will also depend on market conditions prevailing at that time of counterparty default and the overall position of the entity. If an entity is 'long' in generation and the counterparty default occurred at a time of high spot prices, they would financially benefit through increased spot market revenue. Hence there may be other financial linkages which balance out the negative impact of OTC contract default.

In summary, as mentioned, the above indicators are not likely to provide a quantification of the magnitude of systemic risk - rather, they could provide insight into the factors which could increase the likelihood of systemic risk materialising.

27 This is because the total aggregate net position of a participant is made up of underlying gross positions under various OTC contracts with various counterparties. This exposes the participant to a risk of one or more counterparties defaulting under these contracts which is bigger than its overall net position suggests.

4.1 Consultation questions

The Commission welcomes stakeholder views on the following:

Measuring the materiality of systemic risk

4. What are the appropriate methods or indicators for assessing the materiality of systemic risk?

5. Is there a material risk of financial contagion in the NEM?

5 Overview of potential measures

As part of its review, the AEMC will consider a range of measures which aim to increase transparency and improve risk management with a view to reducing systemic risk, which could be introduced if considered necessary, effective and proportionate. These measures include the G20 requirements for OTC derivatives (see Appendix A for more detail), together with measures that consider the risk management position of participants more broadly.

We note that these measures do not include measures that seek to change elements of market design, such as amendments of the market price cap. We consider that such measures may dampen the effect of financial contagion, but are not likely to contribute directly to a reduction of systemic risk. Therefore we have not reconsidered measures to change the design of the wholesale market that these were assessed as part of stage 1 of this review – such as a temporary cap on the spot market price following the default of a large retailer. Concerns raised at that time highlighted the potential for these measures to have wide-reaching implications for the operation of the NEM and the allocation of risks.

To facilitate dialogue with stakeholders, this paper explores a number of potential options which consist of (combinations of) measures. No recommendations are made in this paper. Rather, it seeks to gather stakeholders' views on the potential costs and benefits associated with implementation of the various options. We will consider stakeholders' comments before considering which, if any, of the measures to recommend to SCER. Our proposed recommendations on this will be set out in a second interim report, to be published in early 2014.

This chapter provides an overview of the measures that form the 'building blocks' of these options. More detail on the measures is provided in the chapter seven. Chapter eight presents the range of example options, discusses how they might reduce systemic risk in the NEM, their potential costs and disadvantages, and invites stakeholders views.

5.1 Range of potential measures

The measures that are examined all seek to reduce the level of systemic risk in the NEM, and hence would apply *before* any individual default occurred. They seek to contribute to a better management of risks in the market, with a view to reducing the likelihood of financial contagion following a potential market participant default.

The rationale for implementing any such measures will depend on their ability to mitigate the risk of financial instability and contagion in the NEM as a whole, rather than on their ability to prevent an individual participant from failing. Systemic risk refers to the possibility that the NEM system as a whole might become unstable, rather than the health of individual market participants.

These measures do not seek to replace companies' internal risk management practices, as this could lead to moral hazard.[28] Rather, in conjunction with the existing regulatory framework, they seek to complement internal risk management practices by establishing minimum risk management standards.

To recommend such measures, the case would have to be made that the NEM could be subject to significant levels of financial stress, that the measure being considered would actually reduce systemic risk, and that either:

- there is concern that participants' current internal risk management practices are not sufficiently robust to safeguard that cascading financial failure would be prevented; or
- at times of financial distress, the behaviour of individual participants to protect their own commercial position could actually worsen the overall situation in the NEM as a whole, and not be in the long term interest of customers.

The various measures can be listed under three broad categories, as discussed further below:

- measures that seek to increase transparency;
- measures that seek to improve risk management; and
- additional supervision and powers for a regulatory body to respond to emerging systemic threats.

Measures that seek to increase transparency

Transparency is considered important to reduce systemic risk for a number of reasons. Greater transparency can assist regulators in monitoring the interconnectedness of participants, and the characteristics of the NEM financial system as a whole. Transparency also reduces any role that uncertainty might play in times of financial distress in magnifying the risk of contagion.

However under some circumstances, more information is not necessarily better if it creates confusion or mis-interpretation. The value of such measures will depend on the quality and reliability of the data, and its relevance in providing a basis for making informed decisions, and the ability of regulators to make the necessary decisions.

There are various possible arrangements that could increase the transparency of the NEM financial system. Some of these measures are specifically focused on the OTC derivative market, while others look at the overall risk position of the market participant.

One possible measure is a trade reporting regime such as envisaged under the G20 commitments, aimed at improving transparency about trades that have been conducted (ie, 'post-trade'). Under such a regime, businesses are required to report detailed information about every OTC transaction they have undertaken and to provide information about open OTC positions on a portfolio-level. One version of this measure would require the business to report a regular summary of their OTC transactions.

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28 Moral hazard refers to the situation where one party takes greater risks because it believes other parties will bear some of the costs of those risks, if they arise.

An alternative regime is conceivable, in which market participants perform a stress-test according to a number of scenarios and report on the outcomes of this test. This measure seeks to improve transparency on the overall risk position of the business and allows the regulator to test the robustness of the internal risk management practices under a number of stress scenarios. A stress test regime could be designed in a range of ways, in terms of which participants are covered, how the scenarios are defined and conducted, what information is reported and to whom this information is reported.

A variation of stress test reporting in the electricity market currently exists in New Zealand, although we note that the purpose of the New Zealand stress test is not to assess systemic risk but to make participants aware of the risks associated with being exposed to spot prices.

This category also includes a measure under which participants are required to conduct every standardised OTC trade on an electronic trading platform, which is a measure included in the G20 commitments. The main purpose of such a measure is to improve transparency in the market in order to assist participants in conducting trades, by making certain information available to all participants ('pre-trade'). The question with this option is which OTC trades can be standardised and traded on a platform.

With any transparency measure there is a general question as to whether the reported information would be published and if so by whom and in what format. There may be concerns about the confidential nature of such information.

If participants are required to report sensitive information to a regulator – for example results of a stress test – then they may also be compelled to publish such information to the stock exchange if they are a listed company. Therefore understanding how transparency measures would affect participants' existing reporting obligations will be important in our assessment.

Measures that seek to improve risk management

Measures included in this category seek to reduce systemic risk by subjecting participants to certain defined risk management obligations. This includes the G20 measure to centrally clear all standardised OTC transactions. It also includes a number of risk management measures that, in the G20 framework, are proposed to apply to all derivatives which are not centrally cleared (eg, because they are not standardised), such as an obligation to abide by certain margin requirements.

Another possible measure would be the introduction of a code of best practice for risk management in the electricity sector, which would set out the risk management practices that could be expected of a market participant that is following best practice.

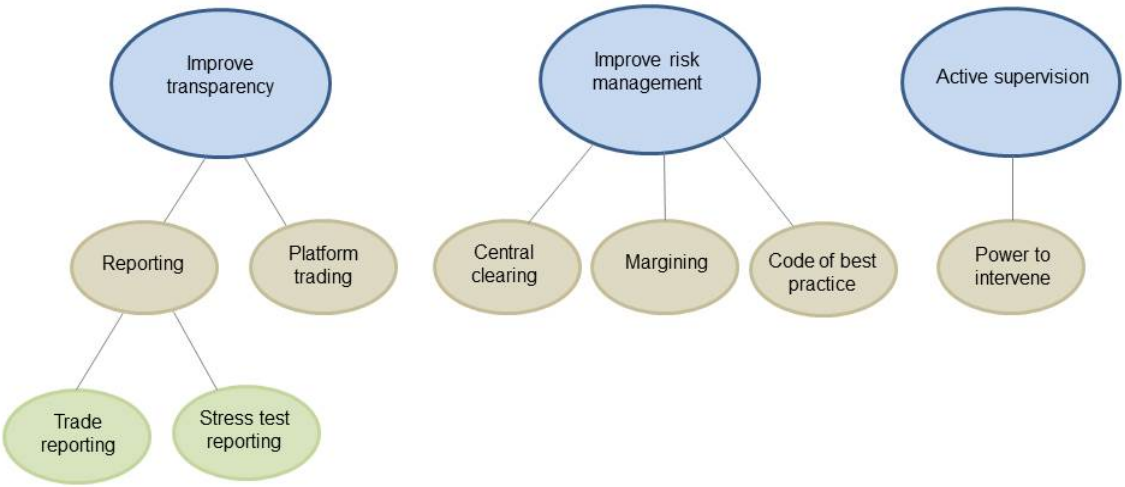
Additional supervision and powers for a regulator to respond to emerging systemic threats

The measure in this category provides a regulator with specific powers and tools to intervene in the energy contract market in order to respond to emerging systemic threats should they occur and contain the risk of broader financial contagion. One possible example of such powers could be the ability to direct a market participant to contain its derivative exposure with other market participants.

This measure may need to be supported with increased transparency measures in order to enable the regulator to monitor the system and adequately assess systemic risks.

The various measures can be illustrated broadly as follows:

Figure 5.1 Range of potential measures



6 Assessment framework

This chapter describes the framework that will guide the AEMC when developing recommendations on the potential application of measures in the NEM. In this process, we will be guided by the NEO and the terms of reference under which the AEMC is to provide advice to SCER.

The NEO is set out in section 7 of the National Electricity Law (NEL) as follows:

> "The objective of this Law 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:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system."

Accordingly, we will only recommend the implementation of any of the measures and options discussed in this paper if we consider that:

- the existing market and regulatory risk management mechanisms are inadequate or could be enhanced, strengthened or supplemented;
- a deficiency has been identified that results in material risk of contagion; and
- implementation of the measure would be likely to promote efficient investment in, and efficient operation of electricity services for the long term interests of consumers of electricity.

The likely impacts and costs and benefits of any new measure need to be assessed against the counterfactual of implementing no new measures. In doing so, we need to first take a view on the risk of financial instability and systemic failure in the NEM. Then we need to consider whether any new measure is likely to:

- contribute to a reduction of the risk of systemic financial contagion in the NEM;
- be effective, that is, it is unlikely to lead to perverse behaviour, or be able to be gamed or by-passed;
- be able to be administered in a cost effective manner;
- support overall efficiency of the NEM;
- be transparent; and
- be proportionate to the materiality of the risk and the problem it seeks to address.

In this context, it is important to consider:

- the relationship between the physical market and the financial contract market;
- the concept of 'systemic importance';
- the definition of 'hedging';
- benefits that any measure may bring to market participants, regulators and the wider public, including the likely effectiveness of any measure; and
- costs that any measure would entail.

These factors are discussed in the following sections.

We note that some of the measures could deliver other benefits, in additional to addressing financial contagion, consistent with the NEO. For example, trade reporting could be used to assist price discovery in the OTC contract thereby improving the efficiency of the market.

We will note the relationship between any new measure and the existing related arrangements on NEM participants, such as those obligations under the Corporations Act and accounting standards. It will be necessary to understand whether introducing new measures would complement these existing obligations on participants.

Regulatory arrangements must also be effective over the long term. This implies applying a sufficiently forward-looking perspective, as trading activity may change over time.

Further, in assessing any measures, the AEMC will consider the interaction with the recommendations made as part of the first stage of the financial market resilience project.

6.1 The relationship between the physical market and the financial contract market

A key aspect in assessing whether any of the above measures would promote achievement of the NEO is the interdependence between the physical market and the financial contract market underpinning the NEM. The financial contract market is a necessary complement to the effective functioning of the wholesale spot market. Market participants need the financial contract market to adequately manage the risks arising from price volatility when trading electricity on the spot market.

Given this interaction, a measure that would improve the functioning of the financial contract market is likely to promote efficient investment in, and efficient operation of, electricity services in the long term interests of consumers and is therefore likely to contribute to achievement of the NEO. Conversely, any measure that would impair the functioning of the financial market underpinning the NEM, and therefore increase overall risk, is likely to adversely impact on achievement of the NEO.

Although the Commission's assessment framework is informed by the NEO, it is important to also consider the interaction with the wider financial markets. The electricity contract market does not operate in isolation from other financial markets. Financial institutions provide financing arrangements to electricity businesses from which certain risk management obligations may arise.

They also provide trade and brokering services and may offer specialised risk management products such as weather derivatives. Banks and other financial intermediaries are therefore active players in the electricity contract market, which means that electricity businesses are financially exposed to the financial sector, and vice versa.

The G20 obligations are envisaged to apply primarily to banks and other financial institutions which typically engage in speculative trade and arbitrage activities. 'End-user' type participants such as electricity businesses primarily trade in commodity

derivatives where, contrary to speculative trades, there is a link with an underlying position in a physical commodity market.

Financial OTC trading by NEM participants services the underlying physical market. This means that the value of financial contracts will be related to a physical component - whether that is a generation asset or a portfolio of customers. Also, as explained in chapter three, vertically integrated participants - who have both generation assets and a customer portfolio - will have a different set of risks to manage which will influence their use of OTC contracts. These factors reduce the risk that an OTC contract could become valueless.

It is therefore also important to be aware of the differences between the wider financial markets and the electricity contract market, for example when considering the concept of 'systemic importance' and the definition of hedging.

6.2 The concept of systemic importance

The SCER request for advice is concerned with risks to financial stability in the NEM arising from financial interdependencies between market participants. It is relevant to consider what this means for the scope of application of any measure. Specifically, whether application of any measure would be limited to those participants that are of 'systemic importance', and whose failure could lead to further cascading failures.

A related question is then how 'systemic importance' would be defined. The EU and US approaches for example apply a threshold related to a participants' overall OTC position for those participants which are not core financial institutions (see sections A.2.1 and A.2.2 in the Appendix).

In this, it is important to be mindful that the concept of 'systemic importance' in relation to the NEM is different from the application of the concept in the context of stability to the overall financial system or the wider economy.

The failure of a large electricity company for example may lead to cascading effects in the electricity contract market, and would therefore be of 'systemic importance' to the NEM, but may not cause major instability to the overall financial system. In this review, we refer to systemic importance as those participants whose failure could potentially lead to financial contagion in the NEM.[29]

Given that it might be more appropriate to use market share indicators to defined systemic importance instead of the OTC position of the participant. Across the NEM, three retailers – AGL Energy, Origin Energy, and EnergyAustralia - jointly supply 76% of customers. The same three entities account for 35% of market share in electricity generation during 2012.[30] However a potential disadvantage of such an approach is that it may create an incentive for participants to re-structure their organisations and split into smaller entities in order to escape any market share thresholds.

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[29] However, as noted in chapter two the effects of failure of electricity businesses may extend beyond the electricity market. The cascading failure of multiple electricity business would be likely to cause significant disruptions to the Australian economy.

[30] AER, State of the Energy Market 2012 Report, p.121. These 3 retailers also account for 85% of gas retail customers.

6.3 The definition of hedging

Chapter three explained how market participants in the NEM need the financial contract market to manage the risks arising from price volatility on the spot market. The Commission must therefore consider whether implementing a certain measure would adversely affect the ability of participants to hedge risk, and in doing so, would be more likely to increase overall systemic risk rather than reduce it.

Regulators in the EU and the US have implemented exemptions to some of the G20 requirements for OTC contracts entered into for the purpose of hedging. In this context, hedging is meant to cover circumstances where the participant has an underlying physical exposure to a price event and it entering into a contract to reduce the risk of that exposure.

As was mentioned in chapter four, market participants have indicated that the distinction between 'hedging' and 'speculation' can however be difficult to make in practice. Such difficulty of establishing a clear distinction may mean that an exemption based on a definition of 'hedging' may therefore not be effective. We invite stakeholders' views on this point.

6.4 Benefits and potential effectiveness of any measure

In its assessment of the potential application of any of the above measures in the context of the NEM, the Commission will examine the benefits a particular measure is likely to bring to market participants, regulators, and the wider public.

Market participants may benefit from a particular measure if it reduces risk in the market or enhances their ability to manage risks.

Regulators may benefit from implementation of a particular measure if it enables them to detect risks to financial stability more effectively, and allows them to better fulfil their mandate. The effectiveness of this depends upon their powers to intervene.

The wider public, which may include investors and governments, could benefit from any measure if it increases transparency and improves their understanding of risks in the market.

An assessment of the benefits of a particular measure also includes considerations as to how effective that measure would be in generating those benefits.

An aspect that may have to be taken into account in this regard is that most electricity businesses also participate in other activities such as gas production and supply. These businesses generally consider risk management on a whole-of-portfolio level, as activities across markets influence risk and revenue decisions in these markets. Also, risks are generally managed through the use of a variety of instruments.

Both aspects raise the question to what extent a measure that imposes obligations on, for example, OTC derivatives in the electricity market would be effective in assessing or reducing the risk of financial contagion.

6.5 Costs associated with any measure

Besides the potential benefits, the Commission will also consider the direct and indirect costs associated with any measure. Direct costs include those directly associated with implementation of the measure, such as costs of necessary IT systems and the costs associated with ongoing monitoring and compliance.

Indirect costs arise, for example, if a measure is likely to increase the costs for market participants of managing risk, or lead to less liquidity in the contract market. This would adversely affect market participants' ability to manage risk. Changes to the regulatory framework will have implications for the allocation of risks in the NEM, and for the resulting incentives for participants. A measure could also lead to undesired responses in participants' risk management practices, in that some participants may decide or may be forced to reduce their hedging activities or may seek to by-pass regulation.

This may mean a measure could in fact *increase* overall risk in the market, and offset or negate any potential benefits. It could also act as a barrier to entry to the market, or precipitate exit from the market, or could increase the incentives towards vertical integration. It is therefore important that we assess how the application of such measures could change participants' trading behaviour.

The extent of these costs will depend upon the scope of measures being applied. As discussed above, exemptions could be given for participants that are not systemically important, or for non-speculative hedging (if this could be effectively defined).

The nature of generation investment, patterns of operation and conditions in the physical electricity market will drive hedging strategies for both generators and vertically integrated retailers. The changing costs and availability of generation will affect whether a participant hedges in the contract market or builds new generation. Any restriction on the nature of hedging that can be undertaken, or any increase in the costs associated with hedging, will in turn affect its generation decisions. This could negatively impact on the extent of competition in both the generation and retail markets of the NEM.

Further, indirect costs may arise if a measure introduces a risk of 'moral hazard'. This may occur when businesses lower their risk management standards or engage in riskier behaviour if there is a perception that, as a result of the measure, the potential costs of taking such risk will be borne, in whole or in part, by others. For example by a government stepping in with financial assistance. The measures do not seek to replace companies' internal risk management practices. Rather, in conjunction with the already existing regulatory framework, they seek to complement internal risk management practices by establishing minimum risk management standards.

6.6 Consultation questions

The Commission welcomes stakeholder views on the following:

Assessment framework

6. Do you agree with the assessment framework as outlined? What (other) factors could be relevant when assessing the potential application of any measures in the context of the NEM?

7. Do you think the concepts of 'systemic importance' and 'hedging' are relevant when considering the scope of applicability of any measure, and how could these concepts be best defined?

7 Description of measures

This chapter describes a range of measures that could be implemented, if considered beneficial, to increase transparency and improve risk management with a view to reducing systemic risk.

They are categorised as follows:

- measures that seek to increase transparency (section 7.1):
  - trade reporting;
  - stress test reporting; and
  - platform trading.
- measures that seek to improve risk management (section 7.2):
  - central clearing;
  - margin and other risk management requirements; and
  - code of best practice in risk management
- additional supervision and regulatory powers (section 7.3).

These measures are the various components that form the options discussed in chapter eight.

7.1 Measures that seek to increase transparency

The aim of the various reporting regimes described below is to increase transparency in the market. Indirectly, they can reduce risk and promote financial stability by enabling participants and regulatory oversight bodies to better assess risks in the market.

As noted in chapter five, understanding how these transparency measures would affect participants' existing reporting obligations, especially for participants who are listed on the stock exchange, will be important in assessing these measures.

7.1.1 Trade reporting

One of the key areas of reform within the G20 package of measures is the mandatory reporting of information about OTC derivative transactions to trade repositories.

The objectives of such a trade reporting regime are to:

- enhance the transparency of transaction information available to relevant authorities and the public;
- promote financial stability; and
- support the detection and prevention of market abuse.[31]

Trade reporting seeks to address the fact that, during the GFC, the opacity of the OTC derivatives market made it difficult for regulators and market participants to assess counterparty risk and the degree of interconnectedness in the market. This inability to

31 *Regulation Impact Statement: G20 OTC derivatives transaction reporting regime*, ASIC, July 2013, p8.

assess counterparty risk contributed to a decline in liquidity as market participants became increasingly reluctant to lend to counterparties that might be insolvent.[32]

As part of the Australian implementation of the G20 commitments, ASIC published rules on trade reporting in July 2013.[33] As mentioned in chapter one, these rules currently do not apply to electricity derivatives. Electricity businesses may nevertheless be subject to reporting rules if they undertake transactions or hold positions in any of the derivatives classes that are currently subject to a reporting requirement.[34] For more information, see section A1 in appendix A.

If the trade reporting rules in their current form were to apply to electricity derivatives, parties to OTC electricity derivative transactions[35] would be required to report detailed information about every OTC contract they enter into.

This includes 55 data fields that apply equally across all derivative classes, which ask for information on the parties to the contract (such as name, trading capacity (intermediary/own account) and domicile) and the details of the contract itself (such as type of contract, starting date and valuation). Similar to other derivative classes, this may be supplemented by a number of additional data fields specific for electricity derivatives.[36] In addition to transaction data, counterparties to electricity OTCs may be required to report on their ongoing positions in OTC electricity derivatives.

The data would have to be reported to trade repositories. Trade repositories can be described as data warehouses which gather, store and provide access to the data they hold.[37] These companies often operate globally and offer a suite of additional services in the area of risk management and central clearing. They gain revenue from fees payable by clients for the services they offer. Trade repositories are bound by rules and are subject to regulatory oversight in order to ensure they comply with strict confidentiality requirements.[38] They need an operating licence in order to offer and perform their services in the market.[39]

The trade reporting rules determine that trade repositories must provide access to the reported data to relevant regulatory oversight bodies such as ASIC and APRA on their

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32 Ibid, p9.

33 ASIC, Derivative Transaction Rules (Reporting) 2013, 9 July 2013.

34 These are: commodity derivatives other than electricity derivatives, credit derivatives, equity derivatives, foreign exchange derivatives and interest rate derivatives.

35 According to the rules on trade reporting, this requirement applies to financial institutions and other businesses which hold an Australian Financial Service Licence. The AEMC understands that most electricity businesses operating in the NEM hold an AFSL.

36 The current rules specify for example that for commodity derivatives other than electricity derivatives, an additional 14 data fields must be reported for each transaction.

37 Examples of companies offering trade repository services include DTCC, CME Group and ICE.

38 See Section 940B of the Corporations Act 2001 and ASIC Derivative Trade Repository Rules 2013.

39 There are currently no licensed Australia trade repositories, but a number of overseas trade repositories can be used to meet an Australian reporting obligation until 30 June 2014, provided the facility has been registered as a derivative trade repository under a law of a foreign jurisdiction. See Corporations Amendment (Derivative Trade Repositories) Regulation 2013, part 7.5A.30, 28 June 2013.

request.[40] These bodies may have access to aggregate-level data, position-level data and transaction-level data (including the identity of counterparties). Data access is not unlimited - it must be in connection with the exercise or performance of the relevant regulators' functions and powers.

This means that ASIC may for example use the data to analyse counterparty risk on the OTC electricity derivative market or to investigate potential market manipulation regarding electricity derivatives. On this basis, ASIC may draw conclusions about the level of risk in the market and risk management practices by market participants, which could potentially lead to further AFS license requirements if necessary. The current trade reporting rules do not provide ASIC and APRA with new regulatory powers to act upon the reporting results if they reveal an emerging threat to financial stability.

Trade repositories are also required to make certain information at an aggregate level available to the wider public.[41] The ASIC trade reporting rules specify that a trade repository must create statistical data, for each reporting period of seven calendar days, about:

- all aggregate open positions as at the end of the last day in the reporting period for which the statistical data is created; and
- volumes by number and by value of derivative transactions reported during the reporting period.

The statistical data created in accordance with this rule must contain certain breakdowns, such as per asset class, currency of the notional amount, type (eg, options, forwards, swaps) and maturity of the OTC derivatives to which the statistical data relates. A trade repository must then disclose these statistical data by making them available at no charge and through a publicly accessible website, between three to five business days after the end of a reporting period.[42]

We note that trade reporting might also improve price discovery in the NEM if the data provided is used to create forward price curves, or industry benchmark indices. Such publication of the data on the aggregated basis could improve the efficiency of the market, while still protecting the confidentiality nature of the data.

40 See section 904b(2) of the Corporations Act and rule 2.3.4 of the ASIC Derivative Trade Repository Rules 2013.

41 CPSS-IOSCO had recommended that "at a minimum, a TR [trade repository] should provide aggregate data on open positions and transaction volumes and values and categorised data (for example, aggregated breakdowns of trading counterparties, reference entities, or currency breakdowns of products), as available and appropriate, to the public." CPSS–IOSCO, *Principles for financial market infrastructures*, April 2012.

42 See rule 2.3.5 of the ASIC Derivative Trade Repository Rules 2013.

7.1.2 Stress test reporting

A stress test reporting regime would require market participants to periodically report information about their ability to deal with major shocks.

A variation of a stress test reporting regime currently exists for the electricity market in New Zealand (see Appendix B). Similar to this regime, a stress testing regime for the Australian electricity market could require electricity market participants to periodically conduct a stress test according to a number of scenarios. The purpose of this test is to assess whether participants can manage financial shocks without transmitting financial distress to other participants.

The scenarios which would form the basis for a stress test would aim to test market participants' resilience when confronted with a number of different shocks to the system. This could include, for example, a scenario in which a participant's biggest counterparty defaults on its obligations during a high price-period.[43] The information could also provide insights into portfolio effects, under which shocks that occur in the electricity market could have knock-on effects on a company's activities in other markets.

The design of the stress test would need to consider a range of factors, including:

- which businesses would be required to undertake the test? For example, all market participants, or only those deemed to be 'systemically important';
- who would design the scenarios? For example, a regulator in consultation with market participants?
- what information would be reported? For example, market participants could be required to report against a number of indicators and ratios that provide information about their ability to absorb the effects of such shocks if the scenarios occur in practice, such as effects on balance sheets and cash flow streams. In addition, market participants could be required to provide other information, such as access to detailed balance sheet data, if considered appropriate. Alternatively, reporting could be limited to a 'yes/no' style confirmation about the businesses' ability to meet its obligations to other participants if the shocks described in each scenario were to eventuate;
- how often would the stress test be undertaken and how would the results be certified? To minimise compliance costs the stress test could be aligned with financial reporting timeframes, with similar certification requirements, confirming the accuracy of the information provided;
- how and to whom would the information be reported? For example, would results be provided to regulators or published? Would they be reported on an individual participant basis or aggregated? In an anonymous form or specified by company?

43 A distinction is sometimes made between 'stress testing', in which a company is to report on its ability to respond to changes in variables (eg prices) and 'scenario testing', which test a company's ability to respond to the occurrence of certain scenarios. In this sense, the stress test described here combines both of these elements.

7.1.3 Platform trading

This measure, as envisaged under the G20 commitments, would introduce a requirement on market participants to conduct OTC derivative transactions, where appropriate, via an electronic trading platform.

Electronic trading platforms provide a facility through which OTC derivatives can be traded electronically and multilaterally. In return for its services, a trading platform charges fees payable by participants.

The purpose of trading platforms is to bring greater transparency to the OTC market. Via such platforms, information about OTC derivatives is made available to all market users. This would include bid and offer prices, quantity available at those prices, and other relevant information before the execution of a transaction (ie 'pre-trade' information).

Improved price transparency could allow better comparability of OTC products and could contribute to 'market making' and more efficient pricing.

Bringing together participants on organised trading platforms could improve liquidity as it may increase the participation of various parties, lower the threshold of bidding and offering into the market and facilitate the matching of bids and offers. In doing so, it could improve operational efficiency and lower the costs for businesses, investors and, ultimately, consumers.[44]

Trading on an electronic trading platform is open to a broad set of participants and may facilitate access to the market, which may in turn decrease the level of counterparty concentration.

In order to be traded on such a platform, OTC transactions would need to be sufficiently standardised. As electricity OTC derivatives are often bespoke, such a requirement would therefore only capture a proportion of the OTC electricity derivative market. Furthermore, requiring 'standardised' trades to be via a platform could provide an incentive for participants to include 'non-standard' elements in their trades in order to avoid the requirement.

Also, a mandatory platform trading requirement could create an incentive for market participants to conduct a trade off-platform and then quickly 'hit' the platform just for regulatory purposes (leading to trades being on the screen for only a few seconds). This would undermine the effectiveness of a trading platform as a transparency and market making measure.

7.2 Measures that seek to improve risk management

7.2.1 Central clearing

During the duration of an OTC contract, contract parties are exposed to the risk that the counterparty may default on its obligations under the contract.

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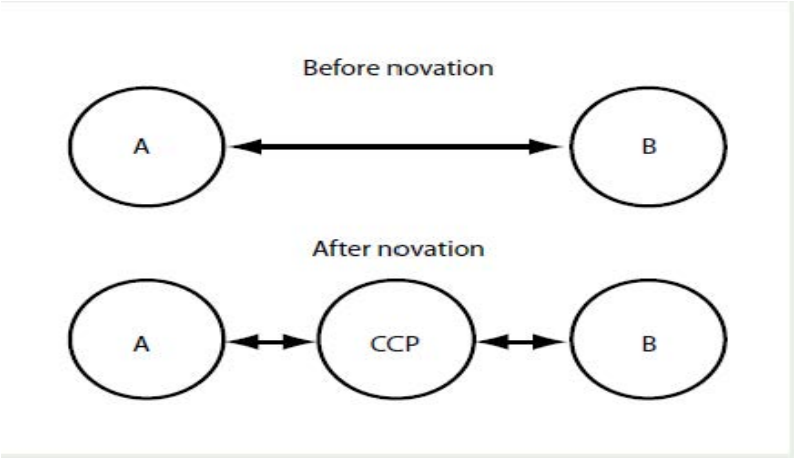
44 Committee of European Securities Regulators, *Standardisation and exchange trading of OTC derivatives*, 19 July 2010. US Commodities Futures Trading Commission, *Core Principles and Other Requirements for Swap Execution Facilities*, 17 CFR Part 37.

The essence of a central clearing regime is that a central counterparty (CCP, also referred to as a 'clearing house') stands in between the two original contract parties, effectively guaranteeing performance of the deal. By interposing itself between the two counterparties to the deal (who would have to be 'members' of the clearing house), a CCP effectively assumes their rights and obligations under the contract. The two parties legally assign their trades to the clearing house, so that the clearing house becomes the counterparty to each of the clearing members. This usually occurs through 'novation'.

Figure 7.1 Novation of central counterparties



Taken from: International Monetary Fund, *Global financial stability report: meeting new challenges to stability and building a better system*, April 2010, p98.

In doing so, a clearing house reduces the counterparty risk that the contracting parties would normally face.

In broader terms, a clearing house can reduce systemic risk by interposing itself as a counterparty to every trade undertaken by its members. This allows a CCP to perform 'multilateral netting' (see box 7.1) and provide various safeguards and risk management practices to safeguard that the failure of a clearing member to the CCP does not affect other members.[45]

In sum, central clearing could simplify the network of financial interconnections between market participants and reduce total credit risk.

In order for a clearing house to clear a product safely and reliably, a number of preconditions must be satisfied:[46]

- the product must have a robust valuation methodology so that the central counterparty can confidently determine margin and default fund requirements;
- there must be sufficient liquidity in the market to allow for close out and/or hedging of outstanding positions in a default scenario;
- there must be sufficient transaction activity and participation so that the fixed and variable costs of clearing the transaction are covered; and

45 International Monetary Fund, *Global financial stability report: meeting new challenges to stability and building a better system*, April 2010.

46 *Australian regulators' statement on assessing the case for mandatory clearing obligations*, ASIC, APRA and RBA, May 2013.

- there must be some standardisation of contracts to facilitate the CCP's trade processing arrangements.

Electricity OTC derivatives are often bespoke and tailored to the specific needs of the contracting parties. It is therefore unclear how effective a mandatory central clearing obligation would be for electricity OTCs, as a proportion of those contracts would be:

- not standardised;
- difficult to value; and
- not liquid.

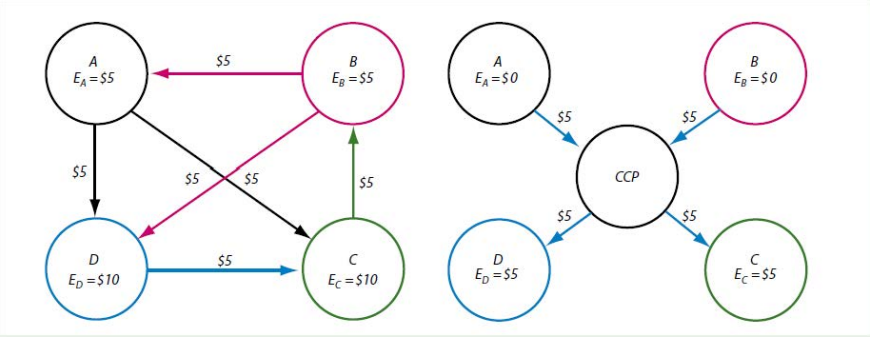
In view of this, market participants may have an incentive to tailor their contracts in such a way that they would not meet the clearing criteria.

Box 7.1: Multilateral netting

Figure 7.2 shows how multilateral netting can reduce the amount of counterparty credit risk. The figure on the left shows contracts across four counterparties in a bilateral world (A,B,C and D). The numbers on the arrows indicate the net replacement costs of the contracts. For example, if the contract between A and B were closed out immediately, B would owe A $5. The E below those letters indicates the maximum counterparty exposure for the counterparty. For example, Ec = $10, as this reflects the sum of the maximum counterparty exposure of C under its contracts with A and D if they both fail.

If all of these contracts were novated to a CCP (figure on the right), all of A's and B's counterparty risk is eliminated, while that of C and D is reduced to $5 each. Overall counterparty risk would therefore be reduced.

Figure 7.2



Taken from: International Monetary Fund, *Global financial stability report: meeting new challenges to stability and building a better system*, April 2010, p98.

A clearing house needs sufficient financial guarantees in order to be able to offer its services. Clearing houses therefore require each member to hold an 'initial margin', which will be used by the CCP to guarantee payments under a member's contracts should it default. In case this margin is not sufficient, losses will be shared by the other clearing members via their initial margins.

In addition, members are required to put up daily 'variation margins', against changes in the value of the contracts. These protection measures allow clearing houses to absorb and mitigate the potential knock-on effects of a major counterparty defaulting.

The margining associated with a clearing obligation also imposes costs on market participants. For electricity businesses, the daily variation margins required under central clearing may be especially significant given the high spot price volatility in the NEM (see box 3.2 for an example).

A mandatory clearing requirement could therefore create cash flow risk for participants and could also reduce their working capital. Ultimately, these impacts could lead to increases in consumer prices and could affect businesses' ability to make investments. This needs to be balanced against potential benefits such as reduced counterparty risk.

Participants unable or unwilling to bear the costs and cash flow risk associated with the daily variation margin calls may choose or be forced to reduce their position in OTC derivatives altogether and instead decide to be exposed to spot market risk to a larger degree. This could increase overall risk in the market.

Market participants have also indicated that the mandatory clearing requirement may lead to more vertical integration, as they may choose to increasingly hedge internally. Increased vertical integration in turn may reduce liquidity in the hedging market and could also cause competition concerns as especially smaller participants may struggle to find counterparties willing or able to contract with them.

However we also note that central clearing arrangements could deliver other benefits to the market. If central clearing provides an opportunity for participants to net off their liabilities and obligations in both the physical wholesale spot market and the financial contract markets, this could lead to cost savings and more effective use of capital in the market.

To some extent, central clearing also replaces the risk of a counterparty to a derivative contract defaulting with the risk of a CCP defaulting. Although central clearing may reduce systemic risk, all the risk is now concentrated in clearing houses, which may become 'too big to fail'.[47]

In addition, competition in the market for clearing houses gives them an incentive to lower their fees. At the same time, competition presents clearing houses with a trade-off between increasing the range of derivatives they are willing to clear and the risk of not being able to find a counterparty. The result could be 'adverse selection' where the clearing house ends up with the most risky counterparties and the least clearable contracts.[48]

In Australia, ASIC and the RBA have co-regulatory responsibility for CCPs (and other clearing and settlement facilities) under the Corporations Act. Clearing houses need to be licensed in order to perform their activities. Currently, two domestic CCPs – ASX Clear and ASX Clear Futures – and one overseas CCP – LCH.Clearnet Limited – are licensed in Australia.

47 L. Nijman, The impact of the new wave of financial regulation for European energy markets, *Energy Policy*, 47 (2012), pp. 468-477.

48 Ibid.

7.2.2 Margin and other requirements

As mentioned in the previous section, only OTC derivative contracts that are sufficiently standardised are suitable for central clearing.

Under the G20 commitments, OTC derivatives that are not centrally cleared would be subject to certain margin requirements and additional risk management practices. The latter refers to practices such as portfolio reconciliation[49], portfolio compression[50] and marking-to-market[51]. The AEMC understands that marking-to-market is actively applied by electricity businesses, although with differing frequency and using varying methodologies.

The purpose of these measures, like central clearing, is to reduce counterparty credit risk.

Regarding margin requirements for non-centrally cleared derivatives, Treasury has indicated that it would await the outcome of the work carried out by the Basel Committee on Banking Supervision (BCBS) and the International Organisation of Securities Commissions (IOSCO) in this area.

BCBS-IOSCO have recently published their final recommendations. They propose that all financial firms and systemically-important non-financial entities that engage in non-centrally cleared derivatives must exchange initial and variation margins as appropriate to the counterparty risks posed by such transactions. For the variation margins, the full amount necessary to fully collateralise the mark-to-market exposure of the non-centrally cleared derivative must be exchanged.[52] What comprises 'systemically-important non-financial entities' is to be determined by domestic authorities.

The BCBS-IOSCO recommendations seek to implement credit support requirements on market participants for those OTC transactions that are not cleared through clearing houses, in order to reduce credit risk.

In relation to the OTC electricity derivatives market, the Australian financial regulators have earlier noted that they believe there is a case for industry and regulatory initiatives to strengthen counterparty credit risk management practices, particularly among larger participants.

According to the regulators, one way to do so may be requiring participants to establish, over an appropriate period of time, credit support arrangements or equivalent arrangements. They suggest the terms of these arrangements should require adequate collateralisation of exposures that exceed specified thresholds, taking into

49 Portfolio reconciliation is intended to enable each counterparty to a transaction to undertake a review of a portfolio of transactions as seen by its counterparty, in order to identify any misunderstandings of key transaction terms.

50 Portfolio compression is the risk management technique whereby counterparties analyse the possibility to net off outstanding positions between them, in order to reduce counterparty credit risk.

51 Marking-to-market allows market participants to estimate and monitor the current value of their contracts, which is subject to price changes, in order to assess their present exposures under their contracts.

52 BCBS-IOSCO, *Margin requirements for non-centrally cleared derivatives*, September 2013.

account the scale of participants' commercial activities. They further note that these arrangements should be an integral component of the entity's overall risk management strategy and systems.[53]

7.2.3 Code of best practice in risk management

During meetings with stakeholders, a number of parties have suggested we consider the option of introducing a code of best practice in risk management for the electricity sector. There are already a range of risk management principles set out in Australian accounting standards.[54] This code would aim to provide a generic framework of principles and guidelines on risk management across industries and businesses building upon existing standards.

The purpose of a code would be to establish risk management practices that would contribute to mitigating the risk of financial contagion in the NEM. The code would take account of the specific characteristics of the electricity sector, such as the use of OTC contracts. By participants signing up to the code, regulators and the broader public may have a greater level of comfort that risk management practices in the NEM are adequate.

The code would not aim to safeguard that individual participants never fail, since that is dependent on a broad range of factors and responsibility lies with the business itself. However, it is likely that, by providing a benchmark for risk management practices, the code would improve the financial resilience of some businesses, if they are not currently operating at 'best practice' levels.

In designing such a code a number of factors would need to be considered, including:

- What would the code contain? As noted above, there are accounting standards in place that establish generic guidelines for risk management. To add value, a code of best practice would need to be tailored more closely to the characteristics of the electricity sector. The code would also need to be sufficiently flexible to recognise the diversity of businesses operating in the NEM, and the different approaches to risk management that may be appropriate. For example, larger businesses could be expected to have more sophisticated risk management practices than smaller businesses.

  Also, larger businesses are more likely to be systemically-important to the NEM, so ensuring they have effective risk management practices is more central to mitigating the risk of financial contagion. Furthermore, the code would need to recognise that businesses operating in the NEM will have varying risk profiles and commensurate return expectations for their shareholders.

  A code of industry practice would be likely to contain standards and guidance relating to the risk management practices discussed in chapter three. This would include:

  — risk management frameworks approved at Board level;

53 *Report on the Australian OTC Derivatives Market*, APRA, ASIC RBA, October 2012, p61.

54 See AS/NZS ISO 31000:2009. Accounting standards for OTC contracts are described in section 3.3.2.

- review of the credit-worthiness of counterparties;
- regular stress testing that demonstrates the resilience of the business to a range of events, including counterparty failure;
- determining appropriate reserves levels; and
- maintaining contingency plans for how the participant could work out a scenario of financial distress.

- Would the code be administered by the industry or a regulatory body? Many industries have developed industry codes of practice as a form of self-regulation, to encourage industry members to meet minimum standards, to promote confidence in the industry, and to avoid the prospect of more formal regulation. Alternatively, administration by a regulatory body would mean that the code is enforced throughout the industry. Also it may be more appropriate for a regulator to administer the code if it is seen as an integral part of regulating the energy sector;
- Who would design the code? The code could be designed by a regulatory body, by industry, or by some combination of these parties. The benefit of industry participants designing the code is that they have detailed knowledge of the risks faced by their businesses, and the way in which those risks are managed.

  The industry could also benefit from sharing their knowledge of risk management with other participants in the industry. However, so that the code responds to broader concerns to reduce the risk of systemic failure, a regulatory body would also need to have a role in developing or approving the code;
- Would the code be voluntary or compulsory? Making adherence to the code a compulsory requirement would provide greater comfort that NEM participants are following best practice in risk management. This could be perhaps via an obligation in the National Electricity Rules. Alternatively the code could be applied on a 'comply or explain' basis. The value of the code would be diminished to the extent that market participants did not sign up to the code, particularly those businesses that are systemically-important to the NEM; and
- How would adherence to the code be confirmed? Adherence to the code could be confirmed in a similar manner to certification of the financial accounts, ensuring that senior management in the firm takes responsibility for the adequacy of the business's risk management practices.

7.3 Additional supervision and regulatory powers

The measures described in the previous sections aim to improve transparency and reduce systemic risk by subjecting market participants to reporting and risk management requirements. These measures do not provide regulators with new powers to intervene in the electricity contract market in order to respond to emerging systemic threats should they occur in order to contain the risk of broader financial contagion.

In the financial sector, APRA has the power to impose certain requirements on financial institutions or to give financial institutions directions in order to mitigate the risk of wider financial contagion.

Powers exist under the current regulatory framework to intervene in the electricity market to maintain power system security and 'keep the lights on'. However, no regulator currently has powers to intervene in the electricity financial market, in a similar manner to APRA in the financial sector, to mitigate the risk of financial contagion.

This would require implementation of additional regulatory tools and powers. They could be added to the powers of an existing regulator or could be conferred on a new, designated 'financial regulator' for the energy market.

If they were introduced, such powers would be used only as 'last resort' measures with a view to reducing the risk of financial contagion and preserving financial stability. In order to reduce the potential for moral hazard, it would be clear that these powers are not meant to prevent the normal exit of individual market participants from the market.

Therefore this measure looks to introduce macro-prudential regulation into the electricity market. A macro-prudential approach recognises the external effects arising from the behaviour of individual participants, as well as the structure of the overall market. By assessing the financial interdependencies between participants, a macro-prudential approach seeks to safeguard the market as a whole.

Macro-prudential regulation can be used both to limit the ex-ante external effects that lead to an excessive build-up of systemic risk, and the ex-post effects that can generate inefficient failures of otherwise sound participants following an individual default. Thus, a macro-prudential regulator has to consider the system wide impacts of its actions.

Given that the overall concern would be to preserve financial stability, any regulatory tools and powers used to address emerging risks could potentially be applied only to systemically important market participants and in circumstances where there is heightened systemic concern.

Powers to preserve financial stability and reduce the risk of contagion could include:

- The power to direct market participants to limit or contain their derivative exposures. The objective of such a power would be to contain large OTC derivative concentrations, so that if a shock resulted in a market participant's insolvency, the systemic ramifications for other market participants are more confined. Given the risks and difficulties associated with withdrawing bilateral hedge contracts already entered, regulatory powers should seek to stop further concentrations from building up, rather than requiring a winding down of existing positions;
- The power to require systemically important market participants to strengthen their balance sheets, by maintaining adequate access to liquidity (to meet any sudden cash flow obligations) and capital (to absorb losses) in periods of heightened systemic concern. Improving the resilience of market participants not only assists in reducing the vulnerability of the system to instability due to contagion through derivative exposures, but also instability that may arise when

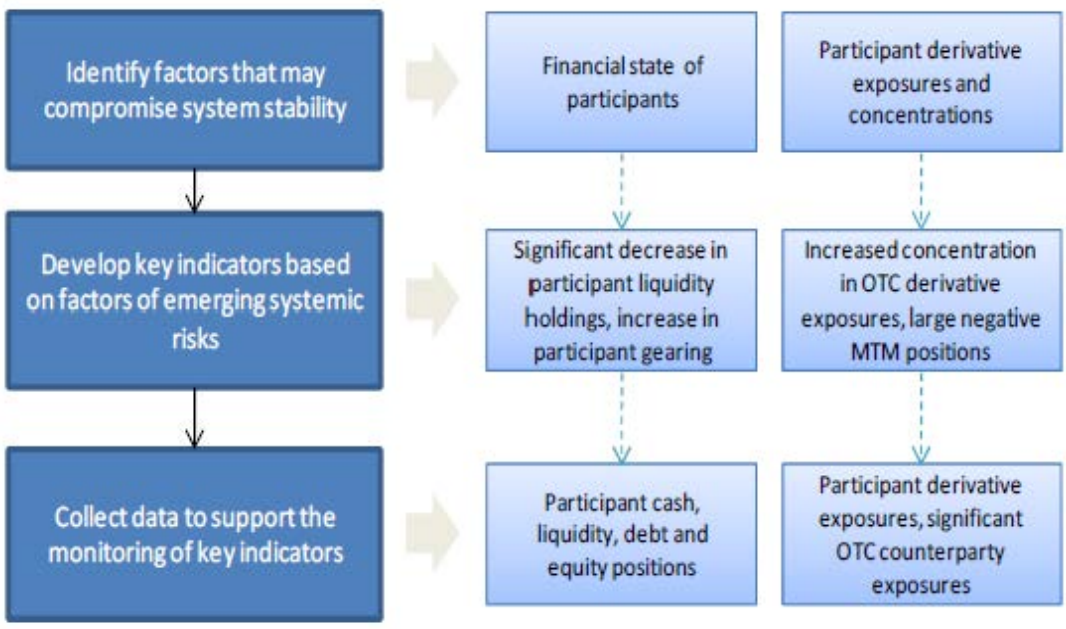
large spot price increases cause pressure on market participants' obligations to other participants and /or AEMO; and

- The power to facilitate an orderly exit from the market when a systemically important market participant faces financial distress and its solvency is at risk. This would include the power to direct distressed systemically important market participants to undertake certain actions prior to potential insolvency in order to contain potential contagion and maintain system stability. Directions may for example include restricting the distressed market participant from entering into any further hedging contracts, purchasing agreements or other financial transactions with other market participants.

In order to be able to exercise these powers if necessary, a regulator would be tasked with monitoring risks in the market on an ongoing basis and collecting the data necessary to perform its functions. It would need the resources to be able to carry out these tasks.

Monitoring the market would require a regulator to identify factors that may compromise the financial stability of the market and develop indicators against those factors. These indicators should be the subject of ongoing monitoring by the regulator. Figure 7.3 illustrates the steps of such a monitoring framework.

Figure 7.3 Monitoring framework



Market participants would be required to provide the data necessary for the monitoring function. In other words: the implementation of such regulatory powers would require implementation of a reporting regime in some form. It also does not preclude the implementation of other 'preventative' measures such as central clearing or margining requirements.

8 Potential options to reduce systemic risk

The previous chapter described measures that could be implemented for the electricity market in order to increase transparency and improve risk management with a view to reducing systemic risk. The measures are not mutually exclusive and various combinations of these measures are possible.

To facilitate dialogue with stakeholders, we have listed a number of potential options, consisting of combinations of the measures discussed in the previous chapter. These options, and an initial assessment of their costs and benefits, are described below. These are examples of potential options developed for consultation purposes and this review is not limited to considering only these options. Please note that the scope of some of these options could be limited to only to those participants considered to be of systemic importance, and not to all NEM participants.

None of these options contains a requirement to conduct OTC transactions on an electronic trading platform as described in section 7.1.3. While there may be potential benefits associated with the use of electronic trading platforms, we consider that the development of such platforms is more appropriately driven by participants' demand for such services rather than through rules-mandated use of such platforms. Also, platform trading requires a high degree of standardisation which, for the reasons discussed in the paper, is unlikely to be possible for all electricity OTC derivatives.

We have also not included a mandatory central clearing requirement, as discussed in section 7.2.1, in any of the options below. While we note that there could be benefits from central clearing, we consider that such a requirement may be of limited use in the context of OTC electricity derivatives, given the often bespoke nature of these OTC transactions. Instead, option five includes margin requirements for those OTC transactions which are not centrally cleared. Under this option, participants could voluntarily move contracts to a central clearing exchange.

We welcome stakeholders' views on the appropriateness of these assumptions regarding the application of platform trading and central clearing to electricity OTC derivatives.

8.1 Option 1 – no new measures

Under this option, a recommendation would be made to SCER that existing arrangements provide sufficient mitigation of systemic risk, because it is considered there is insufficient justification to introduce any new measures. This option accords with a view that:

- the OTC electricity derivatives market is sufficiently transparent to enable participants in the market to assess the interconnectedness and degree of counterparty risk on a whole-of-market basis in order to adequately manage risk;
- risk management obligations arising under the licensing regime overseen by ASIC, complemented by financial debt covenant arrangements and general principles of good corporate governance, provide a sufficiently robust risk management control framework; and

- overall, the status quo on the electricity contract market, in combination with a cost/benefit analysis of any potential measure(s), does not merit the implementation of any additional measure discussed in this paper. Any improvements that could be considered to the existing arrangements would be outweighed by the costs of the measure(s).

8.2 Option 2 - trade reporting

This option would apply the ASIC trade reporting rules as described in section 7.1.1 to OTC electricity derivatives. Accordingly, parties to OTC electricity derivative transactions would be required to report information about every transaction they undertake, as well information about their portfolio position in OTC electricity derivatives.

As explained in section 7.1.1, ASIC would be able to use the information for the fulfilment of its existing powers, such as supervision of licence requirements and detection of market manipulation. Aggregate-level statistical data would also be made available to the wider public.

This option supports a view that:

- there is merit in increasing transparency by providing regulators, market participants and the wider public with more information about OTC electricity derivative activity; and
- the benefits of increased transparency outweigh the potential limitations of the measure and the costs associated with complying with reporting obligations.

8.2.1 How could this option contribute to a reduction of systemic risk?

Trade reporting could provide greater transparency about OTC electricity derivative market activity.

As OTC derivative transactions are conducted bilaterally, market participants will hold information about their own exposures, but may lack insight in financial interdependencies on a whole-of-market level. The absence of a clear whole-of-market picture may affect the ability of market participants to assess the impact of the failure of a large participant.[55] Increased transparency about OTC electricity derivatives market activity through a trade reporting regime could therefore assist NEM participants in their risk management.

ASIC has noted that the detailed and up-to-date information about OTC derivative transactions and market participants' positions in various OTC classes would assist them assessing the interconnectedness and degree of counterparty risk in the market.[56] Such an ongoing, 'real time' reporting regime complements already existing powers of ASIC to gather information from market participants on an ad-hoc basis.

In turn, this would assist ASIC to better manage the stability in the operation of the OTC derivative markets, and optimise their decisions regarding any regulatory

55 Ibid, pp10-11.

56 *Regulation Impact Statement: G20 OTC derivatives transaction reporting regime*, ASIC, July 2013, p9.

intervention that is being considered. Better information about financial interdependencies between market participants means a regulator can choose a range of less intrusive measures and the best timing for intervention, to minimise disruption and moral hazard.[57]

8.2.2 What are the potential costs and disadvantages of this option?

Trade reporting will give a regulator such as ASIC access to information about OTC electricity derivative transactions and positions of market participants in the OTC market. The effectiveness of this measure will depend upon the regulator's ability to process and assess the volume of information received.

Further analysis on the basis of those data needs to be performed in order to arrive at a more complete picture of financial interconnectedness and systemic risk.

Participants in the electricity market primarily enter into OTC contracts to offset risk on the physical commodity market. Without information about the physical side of the trade, or a participant's consumer book or positions in the futures market, information about OTC activity may not be sufficient to get a complete picture of systemic risk. For example, a certain transaction on the OTC derivative market could appear to be 'risky' at face value, but it could be that this transaction is in fact entered into to offset a position by the same market participant on the futures market.

The incompleteness of the information could potentially hamper the effectiveness of a trade reporting regime as a forward-looking risk management tool. Moreover, implementation of a trade reporting requirement per se does not provide a regulator with additional powers to act in case a threat to the stability of the market emerges.

For market participants, the effectiveness of a trade reporting regime in contributing to a better understanding of interconnectedness on a whole-of-market level is dependent on the quality and detail of the statistical information that will be made available by trade repositories. This potential, but uncertain benefit must be weighed against the costs associated with implementing such a requirement.

Besides the indirect costs mentioned above, a trade reporting regime introduces an administrative burden on market participants. Direct costs arise from implementing necessary IT tools and dedicating resources on an ongoing basis to comply with the reporting obligations. To varying degrees, depending on the individual situations of market participants, these direct costs may be incremental, as participants may already have to comply with similar reporting requirements for other classes of derivatives.

As noted in section 7.1.1, trade reporting might also improve price discovery in the NEM if the data provided is used to create forward price curves, or industry benchmark indices for OTC contracts.

8.3 Option 3 - stress test reporting

Under a stress test reporting regime, electricity businesses would be required to perform a stress test according to a number of scenarios and would need to report the results. As discussed in section 7.1.2, there are a range of options regarding the design

57 Ibid.

of a stress test regime, in terms of what information is reported, how often, and to whom. This option does not introduce any new regulatory powers to respond to results that indicate an emerging risk, relying instead on the existing powers of regulatory bodies such as ASIC.

This option would have benefit where there is a view that:

- there is benefit in increasing transparency, and that stress test-reporting is a more useful alternative than trade reporting if the objective is to gain a better insight into the ability of market participants to absorb shocks to the system;
- this measure would provide a more complete picture on the robustness of participants' risk management practices; and
- the benefits of this additional transparency merit the additional costs associated with complying with the reporting obligation.

8.3.1 How could this option contribute to a reduction of systemic risk?

A stress test reporting regime does not provide a regulator with information about every OTC transaction, but could provide additional assurance concerning resilience in the market. Compared to transaction-level reporting, stress test reporting has the advantage that it is not limited to participants' activities in the OTC derivatives market. The stress test would aim to take account of all relevant risk management arrangements and parameters participants have in place when reporting on their ability to absorb certain shocks. It is therefore likely to provide a more complete picture of their ability to withstand shocks.

Increased transparency about stress testing results, strengthened by a requirement for certification similar to that required for financial statements, could lead to better awareness among market participants and the wider public about financial resilience. This could promote better risk management.

8.3.2 What are the potential costs and disadvantages of this option?

Although stress test reporting could provide more direct insight in electricity businesses' financial resilience, the information only provides this information for certain points in time (ie, at the reporting dates).

The financial circumstances of individual market participants could change in between reporting periods, which could affect their ability to withstand shocks to the system. Information on stress test results insofar would not provide a continuous picture of financial resilience.

The effectiveness of a stress test is very much dependent upon the stress scenarios modelled. It may be difficult for the regulator to correctly design the scenarios to credible situations where financial contagion is likely to happen. Ultimately this will involve a degree of judgement by the regulator. If the scenarios are not credible then the results could give a misleading assessment of the robustness of participants' internal risk management practices.

A stress test reporting regime would introduce certain costs in terms of administrative burdens on market participants. These costs may however be limited as most, if not all,

participants already perform stress tests as part of their internal risk management policies.

8.4 Option 4 – code of best practice for NEM participants

This option would involve the introduction of a code of best practice for risk management in the NEM. The Board of each participant would be required on a regular basis to attest that they have complied with the code.

8.4.1 How could this option contribute to a reduction of systemic risk?

A code of best practice for risk management in the electricity sector could have several benefits. It could provide benefits to the businesses through the sharing of information and knowledge about risk management practices in the sector, and assisting management to confirm they have appropriate practices in place.

The code would provide greater transparency regarding risk management practices in the industry, and provide greater assurance to regulators that market participants are following best practice in risk management. This in turn provides greater assurance about the financial resilience of the industry and the management of risks that could lead to financial contagion.

The success of the code in mitigating systemic risk will depend to some extent on the detailed specification and design of the code.

8.4.2 What are the potential costs and disadvantages of this option?

There are a range of potential disadvantages of this option, which would need to be taken into consideration in the design and implementation of the code.

The code would impose direct costs on market participants because they would need to comply with the code and report on their compliance.

There is a risk that the code is too rigid to cater for the diversity of businesses operating in the NEM, and in this way may inhibit businesses from managing their risks in the most effective manner. Alternatively, the code may be so flexible that it reflects minimum standards of risk management in the industry, rather than best practice. Management may focus on meeting the minimum requirements of the code, rather than the most effective approach to risk management for their individual business. Their attention may be diverted away from other issues that have implications for their risk profile, but have not been specifically addressed by the code.

There is also a risk of moral hazard, in that an expectation may arise that any business that meets a code designed and enforced by a regulator will not fail. Also standardising risk management techniques and practices could potentially undermine the scope for parties to compete in terms of the risk management practices they adopt.

8.5 Option 5 - trade reporting + additional margin requirements

This option would apply the ASIC trade reporting rules to electricity derivatives, as mentioned under option two, and would impose additional credit support requirements on non-centrally cleared derivatives as discussed in section 7.2.2.

It supports a view that:

- there are benefits in increasing transparency, as well as in imposing measures aimed at reducing overall credit risk by introducing margin requirements on OTC contracts;
- increased transparency may lead to a better understanding and management of risks. In addition, the market would benefit from a reduction in systemic risk by a reduction in uncollateralised exposures; and
- the benefits of this option outweigh the costs associated with these measures, which arise from compliance costs and costs associated with providing collateral.

8.5.1 How could this option contribute to a reduction of systemic risk?

As mentioned in the section 7.2.1, a proportion of OTC electricity derivatives contracts is unlikely to be able to be standardised to a sufficient level in order to be traded on an exchange. This means it is unsure whether these contracts could be subject to central clearing. The posting of additional credit support such as collateral reduces the credit risk for parties to these contracts. It provides a safeguard in case a counterparty under the contract would default on its obligations.

On a whole-of-market level, it would limit the build-up of uncollateralised exposures, which could reduce systemic risk and broader financial contagion. Under this option, for the proportion of OTC contracts which are standardised to a sufficient degree, market participants can choose to either clear them through a clearing house or have them subject to additional margin requirements.

8.5.2 What are the potential costs and disadvantages of this option?

Posting of collateral raises the costs of OTC derivative transactions, as counterparties to contracts face margin requirements. Participants consider that it would be counterproductive in high stress events because it will impose significant cash flow pressure on participants. This may ultimately lead to higher electricity prices for consumers.

Some market participants may be unable or unwilling to bear the costs of margining for the totality of their OTC derivative contract book which may lead to similar effects as a central clearing obligation. This could include increased exposure of participants to the spot market, increased vertical integration and reduced overall contract liquidity. In turn, this could increase overall risk.

8.6 Option 6 - stress test reporting + additional supervision and regulatory powers

This option combines a stress test reporting regime as mentioned under option 3 with additional supervision and regulatory powers to mitigate contagion as discussed in section 7.3. These powers could include the power to direct market participants to limit or contain their derivative exposures, to strengthen their balance sheets or to facilitate an orderly exit from the market by directing a distressed participant to undertake certain actions prior to potential insolvency in order to contain potential contagion.

This option recognises that there could be benefit in introducing certain powers for a regulator to act if an emerging threat to financial stability were to arise. For a regulator to be able to perform this task a monitoring regime, including a stress test-reporting regime, would be introduced.

8.6.1 How could this option contribute to a reduction of systemic risk?

Giving a regulator powers and resources to intervene in the electricity market if necessary in order to reduce the risk of financial contagion could improve overall financial stability and increase confidence in the market. In turn, this could increase liquidity and lower the cost of contracting, from which market participants and customers would benefit.

Compared to the measures described in section 7.2, which would apply equally across all market participants that are subject to these measures, an intervention by a regulator as described section 7.3 could be tailored to the specific circumstances of a particular situation and market participant.

8.6.2 What are the potential costs and disadvantages of this option?

Direct costs associated with this measure arise from the necessary budget and resources that a regulator would need to be provided with on an ongoing basis. These costs would have to be borne by the Government and/or market participants. If these costs are borne by market participants, they may ultimately lead to higher prices for electricity.

Market participants will face additional costs associated with the requirement to comply with reporting requirements.

There is also a risk that regulatory oversight would lead to non-optimal results. This may occur, for example, if the regulator tasked with the oversight function intervenes too heavy-handedly or becomes too involved with a business' management and commercial decisions.

Further, introduction of such powers could potentially introduce a risk of moral hazard as it may create the impression with participants that a regulator would step in and prevent any participant from failing. Or alternatively, it leads to market participants not carrying out their own robust risk assessment of potential counterparties because it considers that the regulator is adequately doing this.

The costs should also be assessed in light of the probability of major shocks occurring which may trigger application of any regulatory powers.

8.7 Consultation questions

Potential options to reduce systemic risk

8. What is your view on the assumptions made regarding the limited merit of platform trading and central clearing for electricity derivatives?

9. The AEMC would be interested in receiving feedback on these options. Participants are encouraged to discuss what they see as the main costs and benefits of each option, whether they see benefit in one (or more) of these options, or whether there are alternative options that should be considered. We are particularly interested in hearing stakeholders' views on:

- **Do you agree with the elements of a stress testing regime? What could be added or removed to make it more effective?**
- **Do you currently use one or more electronic trading platforms (other than the exchange) to conduct OTC transactions? What are your views on the merit of such platforms?**
- **Given that a contract would need to be sufficiently standardised to be able to be centrally cleared, as discussed section 7.2.1, what percentage of your OTC contract book would in your opinion be suitable for a clearing obligation? What is the volume (in percentage of total and in MWhs) associated with these contracts?**

9 Summary consultation questions

Stakeholders are invited to make submissions on any issues of relevance to this review, and are not limited to the following consultation questions, which are provided for guidance.

Financial contagion and systemic risk

1. Are there other potential channels which have not been identified by this review, as discussed in chapter two?

Risks and risk management in the NEM

2. Please provide any additional comments you may have on the description of risks and risk management set out in chapter three.

3. Do you consider there is merit in the Commission exploring the accounting standards for OTC contracts as part of this review?

Measuring the materiality of systemic risk

4. What are the appropriate methods for assessing the materiality of systemic risk in the NEM?

5. Is there a material risk of financial contagion in the NEM?

Assessment framework

6. Do you agree with the assessment framework set out in chapter five? What (other) factors could be relevant when assessing the potential application of any measures in the context of the NEM?

7. Do you think the concepts of 'systemic importance' and 'hedging' are relevant when considering the scope of applicability of any measure, and how could these concepts be best defined?

Potential options to reduce systemic risk

8. What is your view on the assumptions made regarding the limited merit of platform trading and central clearing for electricity derivatives?

9. The AEMC would be interested in receiving feedback on the options proposed in chapter eight. Participants are encouraged to discuss what they see as the main costs and benefits of each option, whether they see benefit in one (or more) of these options, or whether there are alternative options that should be considered. We are particularly interested in hearing stakeholders' views on:

- Do you agree with the elements of a stress testing regime? What could be added or removed to make it more effective?
- Do you currently use one or more electronic trading platforms (other than the exchange) to conduct OTC transactions? What are your views on the merit of such platforms?
- Given that a contract would need to be sufficiently standardised to be able to be centrally cleared, as discussed section 7.2.1, what percentage of your OTC contract

book would in your opinion be suitable for a clearing obligation? What is the volume (in percentage of total and in MWhs) associated with these contracts?

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AFMA	Australian Financial Markets Association
AFSL	Australian Financial Services License
APRA	Australian Prudential Regulatory Authority
ASIC	Australian Securities and Investments Commission
BCBS	Basel Committee on Banking Supervision
CCP	central counterparty
CFD	contract-for-difference
CFTC	US Commodities Futures Trading Commission
DFA	Dodd-Frank Wall Street Reform and Consumer Protection Act
EA	Electricity Authority of New Zealand
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
G20	Group of 20 countries
GFC	global financial crisis
IOSCO	International Organisation of Securities Commissions
ISDA	International Swaps and Derivatives Association
MWh	Megawatt hour
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NFC	non-financial counterparty
OTC	over-the-counter
RBA	Reserve Bank of Australia
ROLR	retailer-of-last-resort

SCER	Standing Council on Energy and Resources
SEC	US Securities and Exchange Commission

A Implementation of the G20 reforms for the OTC derivative market

A.1 Introduction G20 OTC reforms

The outbreak of the global financial crisis led leaders of the G20 countries to agree on a package of policies, regulations and reforms aimed at improving regulation of financial markets and restoring confidence in the functioning of these markets.

It was also concluded that shortcomings in the (regulation of the) OTC derivatives market contributed to the problems that led to the GFC. The G20 therefore agreed at a summit in Pittsburgh in 2009 that:

> "All standardized OTC derivatives contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest.
>
> OTC derivatives contracts should be reported to trade repositories.
>
> Non-centrally cleared contracts should be subject to higher capital requirements.[58]"

In sum, the G20 commitments introduced the following obligations regarding OTC derivatives:

- trade reporting;
- central clearing of standardised OTC derivatives;
- execution of standardised OTC derivative transactions on an electronic trading platform; and
- higher capital requirements for non-centrally cleared derivatives.

The aim of these reforms is to:

- improve transparency in the derivatives markets;
- mitigate systemic risk; and
- protect against market abuse.[59]

Since the G20 declaration in 2009, work has been undertaken by G20 jurisdictions, including Australia, to implement these reforms. The Financial Stability Board was established by the G20 to monitor implementation progress. Various sub-work streams to work out further details have been carried out by, among others, the International Organisation of Securities Commissions (IOSCO) and the Bank of International Settlements (especially within the Basel Committee on Banking Supervision, BCBS).

The next sections summarise implementation of the G20 commitments by Australia, the European Union and the United States.

58 G20, Pittsburg Declaration, at 10.

59 Ibid.

A.2 Implementation in Australia

Work has been ongoing in Australia to implement the G20 commitments. In February 2013, the new Pt 7.5A of the Corporations Act 2001 became effective.[60] The amendment allows the Treasurer to determine one or more classes of derivatives in relation to which execution requirements, reporting requirements or clearing requirements may be imposed.[61]

ASIC has been granted with the power to make the actual rules ('derivative transaction rules') in these areas.[62]

In making a determination which would make certain classes of derivatives subject to ASIC rule-making, the Minister must have regard to:

- the likely effect on the Australian economy, and on the efficiency, integrity and stability of the Australian financial system; and
- the regulatory impact of allowing the derivative transaction rules to impose requirements to those classes of derivatives.

ASIC must also have regard to these matters when making the derivative transaction rules, and may also have regard to any other matters that ASIC considers relevant, such as any relevant international standards and international commitments.[63]

Before making a determination, the Minister must consult with ASIC, the Australian Prudential Regulation Authority (APRA) and the Reserve Bank of Australia (RBA). These agencies released a Report on the Australian OTC Derivatives Market in October 2012, which recommended that:[64]

- the Australian Government consider a broad-ranging mandatory transaction reporting obligation for OTC derivatives; and
- a mandatory clearing obligation is not necessary for any derivative at that time, but may become necessary in the future.

On 2 May 2013, the Treasurer made a Determination under subsection 901B(2) of the Corporations Act on trade reporting.[65] It determined that reporting requirements may be imposed on the following classes of derivatives:

- commodity derivatives that are not electricity derivatives;
- credit derivatives;
- equity derivatives;
- foreign exchange derivatives; and
- interest rate derivatives.

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60 *Corporation Legislation Amendment (Derivative Transactions) Bill 2012*, 2012.

61 Ibid, section 901B(2).

62 Ibid, section 901A.

63 Ibid, section 903F.

64 *Report on the Australian OTC Derivatives Marke*t, ASIC, APRA and RBA, October 2012.

65 *Corporations (Derivatives) Determination 2013*, 2 May 2013.

Regarding electricity derivatives, the explanatory statement to the Determination stated that their future inclusion will be considered following the completion of the AEMC's financial resilience review.[66]

Following the Treasurer's Determination on trade reporting, ASIC subsequently released final trade reporting rules in July 2013[67], after having consulted on draft trade reporting obligations in March 2013.[68]

ASIC, APRA and the RBA also released a report in July 2013 with recommendations to the Treasurer on the implementation of the central clearing and trade execution obligations.[69]

Trade reporting

The reporting rules that have been published by ASIC in July at this stage only apply to Australian financial institutions and financial intermediaries. This also includes companies which hold an Australian financial services license (AFSL).

So called 'end-users' –counterparties to a derivative transaction which are not financial institutions or financial intermediaries- are excluded from the trade reporting obligation until 31 December 2014.[70] ASIC intends to separately consult on the application of the trade reporting regime to end-users after that date later this year.

The Corporations Act requires entities dealing in OTC electricity derivatives to hold an AFSL. The trade reporting rules that have now been published will therefore impact on those electricity businesses which hold an AFSL.

The published rules foresee in a phased-in approach to the reporting obligation:

- 'Phase 1' reporting obligations start from 1 October this year. This however only applies to those entities which are registered as 'swap dealer' in the US;
- 'Phase 2' reporting obligations start 1 April 2014 and applies to financial institutions and intermediaries (including AFSL holders) with a position in OTC derivatives which exceeds a certain threshold, defined as a total gross notional outstanding of $50 billion or more; and
- 'Phase 3' reporting obligations will commence on 1 October 2014. This applies to financial institutions and intermediaries (including AFSL holders) below the threshold.

It is likely that most electricity businesses which hold an AFSL will fall in this latter category. This means that, from 1 October 2014 onwards, electricity businesses may have to comply with the reporting obligations regarding the derivatives classes listed

66 *Ministerial Trade Reporting Determination, Section 901B(2) Corporations Act 2001, Explanatory Statement*.

67 *ASIC Derivative Transaction Rules (Reporting) 2013*, 9 July 2013

68 *Consultation Paper 205, Derivative Transaction Reporting*, ASIC, March 2013.

69 Report 359, *Report on the Australian OTC derivatives market, A joint report by APRA, ASIC and the RBA*, July 2013.

70 This follows from an amendment to the Corporations Act, which determines that no derivative transaction requirements may be imposed on 'end-users'. The provision ceases to have effect at the end of 31 December 2014. *Corporations Amendment (Derivatives Transactions) Regulation 2013, Select Legislative Instrument, 2013*.

above. As mentioned, this excludes electricity derivatives at this stage, but electricity businesses will have to report on transactions in any of the other OTC derivative classes.

In Phases 1, 2 and 3, 'end-users' (which includes those electricity businesses that do not hold an AFSL) will only be impacted through reporting obligations that may be placed on their counterparties (ie, their banks or other electricity businesses which hold an AFSL). As mentioned, ASIC intends to separately consult on the application of the trade reporting regime to end-users later this year.

The rules prescribe that, for each OTC transaction, certain information must be provided. The reportable information is detailed in a Schedule to the rules. It includes 55 common data fields, which are set out in section A.4. These fields must be filled out for derivative transactions in each of the classes, as well as specific data fields per derivative class. There are 14 additional data fields for commodity derivatives, as shown in section A.4.

The data must be provided to a licensed trade repository. Trade repositories are subject to regulatory oversight by ASIC. Trade repositories are obliged to provide 'continuous, direct and immediate electronic access' to the data to ASIC, APRA and the RBA if so requested. Also, they must produce and disclose statistical information on a more aggregate level, the details of which have not yet been determined. This includes for example information on open positions and volumes (with a breakdown per derivative class). This information must be published on a weekly basis.

Central clearing

In their July 2013 report, ASIC, APRA and RBA conclude that there would be benefit in implementing central clearing for interest rate derivatives and foreign exchange derivatives, based on the 'systemic importance' of these derivative classes. The systemic importance is based on their share in total notional outstanding, as listed in the table below.

Figure A.1 Table OTC derivatives outstanding by instrument

Table 1: OTC Derivatives Outstanding By Instrument
As at end December 2012, per cent

	Australian Banks		Global	
	Share of notional principal outstanding[(a)]	Share of gross market value outstanding[(b)]	Share of notional principal outstanding[(a)]	Share of gross market value outstanding[(b)]
Single-currency interest rate	66.2	61.7	82.9	82.1
Foreign exchange[(c)]	31.1	33.3	11.4	10.0
Credit	1.3	0.8	4.2	3.7
Commodities	1.2	3.6	4.4	1.6
Equity	0.2	0.6	1.0	2.7

(a) Notional principal is the reference amounts from which contractual payments are determined in derivatives markets
(b) Gross market value is the sum of the absolute values of all open contracts with either positive or negative replacement values evaluated at market prices prevailing on the reporting date
(c) Includes cross-currency swaps
Sources: BIS; RBA

Report on the Australian OTC derivatives market, ASIC, APRA and RBA, July 2013, p. 22.

It is the regulators' view that regulatory and commercial incentives may be effective in driving the industry towards central clearing, and that there is evidence that such incentive-led transition is underway.[71]

The joint regulators nevertheless recommend that the Government consider implementing a central clearing obligation for US dollar-, euro-, British pound- and yen- denominated interest rate derivatives, mainly for international consistency reasons as these products are subject to clearing requirements in other jurisdictions. The initial focus of such a mandate should be dealers with significant cross-border activity in these products.[72]

For Australian dollar-denominated interest rate derivatives, the largest derivative market in Australia, the regulators note that transition towards central clearing is underway, but that participants are hampered by a lack of available clearing options. Two clearing houses have recently received approval to offer clearing services for Australian dollar-denominated interest rate derivatives to Australian participants, but operational arrangements are still being put in place at this moment. The regulators have indicated they will therefore monitor progress in implementing clearing arrangements before making any recommendation on mandatory central clearing for these interest rate derivatives. The regulators note that the initial scope of any mandate would likely be the interdealer market.[73]

With financial institutions and dealers being the main target of any mandate at this stage, the regulators consider that further work should be undertaken to understand the incremental cost and benefits of extending a clearing obligation 'beyond the dealer community'. This includes the implication for participants who enter into derivative transactions with a purpose of hedging commercial risks.[74]

For the other derivative classes, including commodities, the regulators do not see reason to recommend introducing mandatory clearing at this stage, mainly because they are not considered to be of systemic importance to the Australian financial system.

Trade execution

The regulators are not making a specific recommendation on a mandatory platform trading obligation in their July 2013-report.

The regulators note that they continue to see in-principle benefits in greater utilisation of trading platforms in the Australian OTC derivatives market, but that it remains unclear how the potential benefits of mandatory platform trading might best be realised. In particular, further consideration needs to be given to what constitutes an acceptable trading venue for these purposes, with relevant rulemaking still in progress in major jurisdictions elsewhere. Accordingly, the regulators indicated they will

71 Report 359, *Report on the Australian OTC derivatives market, A joint report by APRA, ASIC and the RBA*, July 2013, p2.

72 Ibid, p33.

73 Ibid, p29.

74 Ibid, p30.

continue to monitor developments in other jurisdictions and seek more detailed information on activity in the Australian market.[75]

Risk management and higher capital requirements

The regulators have previously recommended enhancements to participants' risk management practices in a number of areas, such as around collateralisation, trade compression and portfolio reconciliation.[76] The regulators however do not make any recommendations in this area in their July 2013 report.

On collateralisation, like the authorities in the EU and the US, the regulators note they will await the outcome of ongoing international discussion on principles on margin requirements for non-centrally cleared trades before making any recommendation.[77]

A.3 Implementation in major overseas jurisdictions

A.3.1 Implementation in the European Union

The EU has implemented its G20 obligations primarily through Regulation 648/2012 *on OTC derivatives, central counterparties and trade repositories* (referred to as 'EMIR' – European Market Infrastructure Regulation). EMIR was adopted on 4 July 2012 and came into force on 16 August 2012. EMIR is complemented by a number of 'regulatory technical standards' (RTSs) implementing further details, which entered into force on 15 March 2013.

Broadly, EMIR includes obligations for OTC derivatives in the following areas:

- central clearing
- trade reporting
- risk management.

In addition to EMIR, the (proposed) Markets in Financial Instruments Directive and Regulation (MiFID and MiFIR) contain obligations on trade execution relevant for OTC derivatives.

Central clearing

EMIR specifies that counterparties to an OTC transaction must clear all OTC derivative contracts in an authorised central counterparty (CCP, more generally referred to as a 'clearing house') if they pertain to a class of OTC derivatives that has been declared subject to this clearing obligation.[78]

This determination will be made by the European Securities and Markets Authority (ESMA) and submitted to the European Commission for endorsement. EMIR states that

75 Ibid, p36.

76 Trade compression is the risk management technique whereby counterparties analyse the possibility to net off outstanding positions between them, in order to reduce counterparty credit risk. Portfolio reconciliation is intended to enable each counterparty to a transaction to undertake a review of a portfolio of transactions as seen by its counterparty, in order to identify any misunderstandings of key transaction terms.

77 Ibid, p37-38.

78 EMIR, article 4

the overall aim of the clearing obligation is to reduce systemic risk.[79] This notion is to be taken into account by ESMA when deciding which classes of derivatives should be subject to central clearing.

The following criteria are considered relevant in this determination:

- The degree of standardisation of the contractual terms and operational processes of the relevant class of OTC derivatives;
- The volume and liquidity of the relevant class of OTC derivatives; and
- The availability of fair, reliable and generally accepted pricing information in the relevant class of OTC derivatives.[80]

No determinations have been made yet, but ESMA has recently released a Discussion Paper on this topic.[81]

For a non-financial counterparty (NFC), such as an energy business, the clearing obligation only applies if and when its position in OTC derivative contracts exceeds a certain threshold.[82] This threshold is intended to reflect the systemic relevance of the related risks and therefore varies per class of derivatives.

For NFCs, when calculating the positions relevant for the clearing threshold, an important exception applies to OTC derivative contracts entered into which are "objectively measurable as reducing risks directly relating to the commercial activity". These types of contracts are to be excluded from the calculation.[83]

This is intended to exclude hedging (as opposed to speculative trading) for the purposes of calculating the clearing threshold as it is considered participants enter into hedge-OTCs for the purpose of reducing risks directly related to a participant's commercial and treasury activities.[84]

Trade reporting

EMIR introduces a general obligation on counterparties to report details of any derivative contract they have concluded (including modifications and termination) to a licensed trade repository.[85] This obligation covers both OTC derivative contracts and other derivative contracts.

This reporting needs to take place no later than the day following the conclusion (or modification, termination) of the contract. The data to be reported include data on the

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79 EMIR, preamble considerations 15-21

80 EMIR, article 5(4)

81 *Discussion Paper. The Clearing Obligation under EMIR*, ESMA, 12 July 2013.

82 EMIR, article 4 and 10(1)(b). The thresholds for various categories of OTC contracts are as follows:
- EUR 1 bn in gross notional value for OTC credit derivative contracts and equity derivative contracts (where gross notional value' means that both sides of the transaction count for the purpose of this calculation (which effectively creates an incentive to net off);
- EUR 3 bn in gross notional value for OTC interest rate derivative contracts, foreign exchange derivative contracts, commodity derivative contracts and other contracts.

83 EMIR, article 10(3).

84 See eg EMIR, preamble consideration 30.

85 EMIR, article 9.

counterparties themselves, and on the contract(s) concluded between them. Some general data must be reported for every OTC contract, while certain additional data must be supplied for various specific types of OTC contracts. The information must be provided on a transaction-level basis.[86]

EMIR introduces a general obligation on trade repositories to 'regularly', and in easily accessible format, publish aggregate positions by class of derivatives on the contracts reported to it.[87] This publication must occur on a website or an online portal which is easily accessible by the public.[88]

A trade repository also has the duty to make the data available to a number of regulatory oversight bodies, such as ESMA and national financial markets supervisory authorities.[89] These institutions must be provided access to data at transaction level (individual trade details).

Risk management and higher capital requirements

Financial counterparties and NFCs that enter into OTC derivative contracts which are not centrally cleared must ensure that appropriate procedures and arrangements are in place to measure, monitor and mitigate operational risk and counterparty credit risk.

OTC derivative contracts that do not have to be centrally cleared because they are entered into for the purposes of hedging are therefore subject to a number of additional risk management requirements. These include trade confirmation, portfolio reconciliation and portfolio compression. Exact obligations may be different for NFCs, depending on whether they cross the clearing threshold or not. Rules on margining and collateral requirements await the outcome of the work currently being undertaken by BSCB-IOSCO.

A.3.2 Implementation in the United States

In the United States, the basic act implementing the G20 commitments is the *Dodd-Frank Wall Street Reform and Consumer Protection Act*(DFA).[90] The DFA was enacted in July 2011.

The DFA provides the Commodity Futures Trading Commission (CFTC) and the Securities and Exchange Commission (SEC) with the authority to regulate certain types of derivatives that currently are entered into bilaterally and that are typically not cleared.

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86 Article 1, *Commission delegated regulation 148/2013, of 19 December 2012, supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards on the minimum details of the data to be reported to trade repositories*.

87 EMIR, article 81(1).

88 Article 1, *Commission delegated regulation 151/2013, of 19 December 2012, supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards specifying the data to be published and made available by trade repositories and operational standards for aggregating, comparing and accessing the data*.

89 EMIR, article 81.

90 Information generally derived from CFTC and SEC *Joint Report on International Swap Regulation*, 31 January 2012.

Essentially, the CFTC is required to regulate derivatives defined as 'swaps', while the SEC is to regulate derivatives defined as 'security-based swaps'.

The DFA amends a number of other acts to establish a new regulatory framework for swaps which includes:

- registration and regulation of 'swap dealers', 'security swap dealers', and 'major swap participants' and 'major security swap participants';
- clearing and trade execution requirements on swaps;
- recordkeeping and real-time reporting regimes; and
- strengthening of enforcement and regulatory oversight.

The purpose of the new framework is to reduce risk, increase transparency and promote market integrity within the financial system.

The term 'swap dealer' refers to entities which are:

- holding oneself out as a dealer of swaps;
- making a market in swaps;
- regularly entering into swaps with counterparties as an ordinary course of business for one's own account; and
- engaging in activity causing oneself to be commonly known in the trade as a dealer or market maker in swaps.

The statutory definition of 'major swap participant' encompass entities that are not a swap dealer but which could nonetheless could pose a high degree of risk to the US financial system generally, for example because they hold a substantial position in any of the major categories of swaps.

The definition of 'substantial position' excludes positions held for "hedging or mitigating commercial risk". These hedging positions must be 'economically appropriate' to the reduction of risks in the conduct and management of a commercial enterprise, where the risks arise in the ordinary course of business from, for example, a potential change in the value of assets that a person owns, produces, manufactures, processes, or merchandises.

Under the DFA, a swap is required to:

- be cleared through a derivatives clearing organisation if the CFTC or SEC has determined that the swap is required to be cleared, unless an exception to the clearing requirement applies;
- to be reported to a swap data repository or the CFTC/SEC; and
- if the swap is subject to a clearing requirement, to be executed on a 'designated contract market' or swap execution facility.

Central clearing

Swaps for which the CFTC or SEC has determined the clearing requirement applies must be submitted for clearing to a clearing house.

The factors that must be taken into account when making a determination on whether certain swaps are required to be centrally cleared include:

- the existence of significant outstanding exposures, trading liquidity and adequate pricing data;
- the availability rule framework, capacity, operational expertise and resources, and credit support infrastructure to clear the contract (…); and
- the effect on the mitigation of systemic risk, taking into account that size of the market for such contract and the resource of the clearing house available to clear the contract.

There is an exception to the clearing obligation for swaps if one of the swap counterparties:

- is not a financial entity (but an 'end-user');
- is using the swap to hedge or mitigate commercial risk; and
- notifies the CFTC (for swaps) or the SEC (for security based swaps) how the counterparty generally meets its financial obligations associated with entering into non-cleared swaps.

The term 'financial entity' includes swap dealers, security swap dealers, major swap participants and major security-based swap participants.

The exception is meant "*to permit non-financial companies to continue using non-cleared swaps to hedge risks associated with their underlying business such as manufacturing, energy exploration, farming, transportation or other commercial activities.*"[91]

Whether a swap is used to hedge or mitigate commercial risk is to be determined by the facts and circumstances existing at the time the swap is entered into, and should take into account a person's overall hedging and risk mitigation strategies. It is intended to exclude swaps that are being held for the purpose of trading, speculating and investment. The swap must also be 'economically appropriate' to the reduction of any risk. These criteria for what defines 'hedging' are meant to be 'as consistent as possible' with the criteria for what defines hedging as established under the 'major swap participants'-exemption noted earlier.[92]

In other words, like the EU regime, the US regulation includes an exemption for derivatives entered into for hedging purposes from the obligation to centrally clear OTC transactions, if certain criteria are met.

Trade reporting

The DFA requires all swaps to be reported to a registered data repository or, if no such repository will accept the swap, to either the CFTC or the SEC. This obligation applies to both cleared and uncleared swaps.

91 End-user exception to the clearing requirement for swaps-rule, CFTC 19 July 2012, p. 42560.

92 Ibid, p. 42576.

Reporting of the data related to the swap, including price and volume, needs to take place 'as soon as technologically practicable after the time at which the transaction has been executed.'

The reporting obligations require swap data repositories, swap dealers, major swap participants and non-swap dealer/major participant counterparties to keep full, complete and systemic records of all activities relating to the business of such entities with respect to swaps.

The CFTC and SEC have direct access to the swap reporting data. They may also require swap data repositories to publicly disseminate the transaction and pricing data required to be reported.

The CFTC and SEC will issue semi-annual and annual written reports to make publicly available information (aggregate data) relating to trading and clearing in major swap categories and market participants and developments in new products.

Risk management and higher capital requirements

The DFA introduces a number of prudential regulatory requirements. These include requirements related to capital, margining, risk management, segregation and liquidity.

Swaps entities (which include swap dealers and major swap participants but not 'end-users') are required to comply with minimum capital and minimal initiation and variation margin requirements.

The CFTC and SEC are yet to prescribe the precise capital and margin requirements. Like in the EU, this determination is halted until discussions within IOSCO on this topic have progressed.

In the proposed rules, swap dealers and major swap participants that enter into uncleared swaps must collect initial and variation margin, subject to possible thresholds. The thresholds and other margin requirements will depend on whether the counterparty to an uncleared swap is a:
(i) another swap dealer or major swap participant;
ii) a financial entity, or
iii) a non-financial entity.
Non-financial entities must enter into collateral arrangement but thresholds may apply.

A.4 Trade reporting requirements in Australia

The following tables provide details of the data fields for which trade reporting will be required in Australia, as discussed in section A.2.

Table A.1 Trade Reporting: Common data fields

Item	Label	Derivative Transaction Information
1	Unique transaction identifier	The universal transaction identifier for the Reportable Transaction or, if no universal transaction identifier is available, the single transaction identifier as used by the counterparties or the trade identifier used by the trading venue (if applicable) on which the Reportable Transaction was executed, or if none of these are available, the internal trade identifier used by the

		Reporting Counterparty.
2	Unique product identifier	The universal product identification code for the Derivative to which the Reportable Transaction relates, based on the taxonomy of the Derivative or, if no universal product identification code is available, a product identification code of the Derivative using an internationally accepted product taxonomy.
3	Contract type	The type of Derivative to which the Reportable Transaction relates, such as "swap", "swaption", "forward", "option", "basis swap", "index swap" or "basket swap", unless this information is contained in the unique product identifier referred to in item 2, in which case this field may be left blank or omitted.
4	Underlying	A unique identifier for the underlying to the Derivative to which the Reportable Transaction relates, or, if no unique identifier is available in the case of baskets or indices, a notation to indicate that the underlying is a basket or index.
5	Identifier of Reporting Counterparty	An identifier of the Reporting Counterparty, using: (a) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (b) in the case of an individual, a client code assigned by the Reporting Counterparty.
6	Name of Reporting Counterparty	The legal name of the Reporting Counterparty identified under item 5.
7	Identifier of Non-Reporting Counterparty	An identifier of the Non-Reporting Counterparty, using: (a) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (b) in the case of an individual, a client code assigned by the Reporting Counterparty.
8	Name of Non-Reporting Counterparty	The legal name
9	Trading capacity of Reporting Counterparty	A notation to indicate whether the Reporting Counterparty has concluded the Derivative to which the Reportable Transaction relates: (a) as principal on its own account (on its own behalf or on behalf of a client); or (b) as agent for the account of and on behalf of a client.
10	Identifier of beneficiary	If the beneficiary of the rights and obligations arising from the Derivative to which the Reportable

		Transaction relates is not the Reporting Counterparty: (a) an identifier of the beneficiary of the Reporting Counterparty, using: (i) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (ii) in the case of an individual, a client code as assigned by the Reporting Counterparty; or (b) where the Reportable Transaction was executed via a structure, such as a trust or managed investment scheme, representing a number of beneficiaries, an identifier of the structure (i.e. as the trust or managed investment scheme).
11	Name of beneficiary or structure	The legal name of the beneficiary or structure (if any) identified under item 10.
12	Identifier of person making report	If the person reporting the Reportable Transaction to the Derivative Trade Repository is not the Reporting Counterparty, an identifier of the person using: (a) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (b) in the case of an individual, a client code assigned by the Reporting Counterparty.
13	Name of person making report	The legal name of the person identified under item 12.
14	Domicile of Reporting Counterparty	The jurisdiction of incorporation or formation of the Reporting Counterparty.
15	Identifier of broker	An identifier of the broker that executed the Reportable Transaction on behalf of the Reporting Counterparty (if applicable), using: (a) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (b) in the case of an individual, a client code assigned by the Reporting Counterparty.
16	Name of broker	The legal name of the broker (if any) identified under item 15.
17	Whether the Derivative has been centrally cleared (to be amended if cleared after initial	A notation to indicate whether the Derivative to which the Reportable Transaction relates has been centrally cleared.

	report made)	
18	Name of central clearing facility	The name of the central clearing facility where the Derivative to which the Reportable Transaction relates was cleared (if applicable).
19	Identifier of clearing Member	An identifier of the clearing member that cleared the Derivative to which the Reportable Transaction relates (if applicable), using: (a) in the case of an entity, a Legal Entity Identifier (LEI) or interim entity identifier or, if no LEI or interim entity identifier is available for the entity, an Australian Business Number (ABN) or, if no ABN is available, a Business Identifier Code (BIC code); or (b) in the case of an individual, a client code assigned by the Reporting Counterparty.
20	Name of clearing Member	The legal name of the clearing member (if any) identified under item 19.
21	Whether the Derivative has been confirmed	A notation to indicate whether the terms of the Derivative to which the Reportable Transaction relates have been confirmed by both counterparties to the Derivative.
22	Form of confirmation	If the terms of the Derivative to which the Reportable Transaction relates have been confirmed by both counterparties to the Derivative, a notation to indicate whether the confirmation was electronic or non-electronic.
23	Confirmation Timestamp	The time and date (expressed as AEDT/AEST as applicable – see Rule 1.2.1) the terms of the Derivative to which the Reportable Transaction relates were confirmed by both counterparties (if applicable).
24	Execution venue	If the Reportable Transaction: (a) was executed on a trading venue, an identifier code of the trading venue or, if no identifier code is available for the trading venue, the name of the trading venue; or (b) was not executed on a trading venue, a notation to indicate that there was no trading venue.
25	Master agreement type	The type of master agreement that was executed in relation to the Derivative to which the Reportable Transaction relates (eg, ISDA Master Agreement, Master Power Purchase and Sale Agreement, International ForEx Master Agreement, European Master Agreement or any local Master Agreements).
26	Master agreement date	The year of the version of the master agreement identified under item 25.
27	Derivative-effective date or start date	The date when the obligations under the Derivative to which the Reportable Transaction relates, come into effect.
28	Maturity, termination or end date	The date of expiry of the Derivative to which the Reportable Transaction relates.
29	Delivery type	A notation to indicate whether the Derivative to which

		the Reportable Transaction relates is physical (deliverable) or cash (non-deliverable) or a combination of both physical and cash.
30	Mark-to-market/ mark-to-model/ other value of Derivative	The valuation of the Derivative to which the Reportable Transaction relates, as calculated using the method identified under item 32.
31	Currency used for mark-to-market/ mark-to-model/ other valuation	The currency used for the valuation referred to in item 30.
32	Valuation type (mark-to-market/ mark-to-model/ other)	A notation to indicate whether the valuation referred to in item 30 was a mark-to-market or mark-to-model valuation, or a different form of valuation.
33	Counterparty side (buy/sell)	A notation to indicate whether the Reporting Counterparty is the buyer or seller of the Derivative to which the Reportable Transaction relates.
34	Basis	The day count for calculation of periodic payments under the Derivative to which the Reportable Transaction relates (eg, A/365, quarterly, semi-annual) (if applicable).
35	Settlement rate or index	The index for calculation of settlement payments under the Derivative to which the Reportable Transaction relates (eg, the Bank Bill Swap Reference Rate).
36	Expiry conventions/cut	Place of time zone and time of expiry of the Derivative to which the Reportable Transaction relates (e.g. 3 pm, Tokyo; 10 am, New York).
37	Execution timestamp	If the Reportable Transaction was executed on a trading venue, the time and date (expressed as AEDT/AEST as applicable - see Rule 1.2.1) the Reportable Transaction was executed on a trading venue.
38	Clearing timestamp	If the Derivative to which the Reportable Transaction relates was centrally cleared, the time and date the Derivative was cleared.
39	Reporting timestamp	The time and date (expressed as AEDT/AEST as applicable - see Rule 1.2.1) the Reportable Transaction is reported to the Derivative Trade Repository.
40	Collateralisation	A notation to indicate whether the Reportable Transaction is collateralised by one or both counterparties to the Reportable Transaction.
41	Collateral portfolio	If the Reportable Transaction is collateralised, a notation to indicate whether the collateralisation was performed on a Portfolio Basis.
42	Collateral portfolio code	If the Reportable Transaction is collateralised and collateral is reported on a Portfolio Basis, a unique code, determined by the Reporting Counterparty, to identify the portfolio.
43	Value of collateral	If the Reportable Transaction is collateralised:

		(a)the value of the collateral posted by the Reporting Counterparty to the Non-Reporting Counterparty; or (b) where collateral is posted by the Reporting Counterparty to the Non-Reporting Counterparty on a Portfolio Basis, the value of all collateral posted for the portfolio.
44	Currency of collateral value	The currency of the collateral value identified under item 43.
45	Option type	If the Derivative to which the Reportable Transaction relates is an option, a notation to indicate whether the option is a call or a put.
46	Option expiration date	If the Derivative to which the Reportable Transaction relates is an option, the expiry date of the option.
47	Option premium	If the Derivative to which the Reportable Transaction relates is an option, the amount of the premium paid by the buyer to the seller.
48	Option premium currency	If the Derivative to which the Reportable Transaction relates is an option, the currency used to calculate the option premium identified under item 47.
49	Option style	If the Derivative to which the Reportable Transaction relates is an option, a notation to indicate whether the option can be exercised on a fixed date ("European", "Asian"), on a series of fixed dates ("Bermudan"), or at any time during the life of the Derivative ("American").
50	Strike price (cap/floor rate)	If the Derivative to which the Reportable Transaction relates is an option, the strike price of the option.
51	Barrier type	If the Derivative to which the Reportable Transaction relates includes a barrier, the type of barrier in the Derivative ("European", "American", "Bermudan" or "other").
52	Barrier value	If the Derivative to which the Reportable Transaction relates includes a barrier or barriers, the rate or level of the barrier or barriers.
53	Rate reset frequency	Frequency with which the rate leg resets (if applicable).
54	Hedging transaction	An indication of whether the Derivative to which the Reportable Transaction relates is entered into by the Reporting Entity for the purpose of managing a financial risk that arises in the ordinary course of business.
55	Action type	A notation to indicate whether the report being made relates to : (a) a Reportable Transaction that is an entry into of an arrangement that is a Derivative, in which case the notation must be "new"; (b) a Reportable Transaction that is a modification of an arrangement that is a Derivative, in which case the notation must be "modify"; (c) a Reportable Transaction that is a termination of an arrangement that is a Derivative, in which case the

		notation must be "cancel"; or (d) a compression of a Derivative, in which case the notation must be "compression". For the purposes of subrule 2.2.2(1), a notation to indicate whether the change relates to: (a) a cancellation of a report previously made in error, in which case, the notation must be "error"; (b) a change or update to the information referred to in items 30–32 (mark-to-market, mark-to-model, or other valuation) or items 40–44 (collateral), in which case the notation must be "valuation update"; or (c) any other amendments to a report previously made, in which case the notation must be "other".

Table A.2 Trade Reporting: Additional data fields for commodity derivatives

Item	Label	Derivative transaction information
1	Notional amount	The total notional amount, or total quantity in the unit of measure of the commodity underlying the Derivative to which the Reportable Transaction relates, or payout where a fixed payment is made at maturity based on certain conditions being met at expiry or during the life of the Derivative to which the Reportable Transaction relates.
2	Notional currency	The currency of the total notional amount or payout (if applicable) identified under item 1.
3	Grade	The grade of product being delivered.
4	Amount of upfront payment, if any	The amount of any upfront payment the Reporting Counterparty has made or received in relation to the Derivative to which the Reportable Transaction relates.
5	Payment frequency	The dates on, or frequency with which, the agreement executed in relation to the Derivative to which the Reportable Transaction relates requires payments to be made.
6	Quantity unit	A unit to measure the quantity of each side of the Derivative to which the Reportable Transaction relates (e.g. barrels, bushels).
7	Quantity	The amount of the commodity (the number of quantity units) quoted on the Derivative to which the Reportable Transaction relates.
8	Quantity frequency	The rate at which the quantity is quoted on the Derivative to which the Reportable Transaction relates (e.g. hourly, daily, weekly, monthly).
9	Total quantity	The quantity of the commodity for the entire term of the Derivative to which the Reportable Transaction relates.
10	Delivery point or zone	The location of the delivery of the commodity underlying the Derivative to which the Reportable Transaction relates.

11	Delivery start date and time	The start date and time (expressed as AEDT/AEST as applicable - see Rule 1.2.1) of delivery of the commodity underlying the Derivative to which the Reportable Transaction relates.
12	Delivery end date and time	The end date and time (expressed as AEDT/AEST as applicable - see Rule 1.2.1) of delivery of the commodity underlying the Derivative to which the Reportable Transaction relates.
13	Derivative capacity	The quantity per delivery time interval of the commodity underlying the Derivative to which the Reportable Transaction relates.
14	Commodity base	A notation to indicate the type of commodity underlying the Derivative to which the Reportable Transaction relates.

B Spot price risk exposure regime (stress testing regime) in New Zealand

The New Zealand Electricity Industry Participation Code contains a 'spot price risk disclosure regime', which was included in the rules in 2011.[93] This regime requires each purchaser of electricity in the spot market to calculate and report their exposure to high spot prices on a quarterly basis in a so-called 'spot price risk exposure statement'.

The purpose of the regime is to make participants in the market aware of the risks associated with being exposed to spot prices. It provides a mechanism for participants buying electricity on the spot market to analyse the risks they are taking, and disclose the level of risk they have decided to assume.[94] It is a measure that the Electricity Authority (EA) has adopted to encourage the industry to better manage dry years and other shortages, when spot market prices are particularly high.[95] The EA has noted that it does not make a judgement about the different levels of risk tolerance exhibited in the data and also that participants themselves are accountable for the impacts of their decisions.[96]

The spot price risk exposure statement must be sent to an independent 'registrar', for which the New Zealand exchange has been appointed by the EA.[97]

The spot price risk exposure must be calculated on the basis of stress test scenarios, developed out by the EA. It is therefore also referred to as the 'stress testing regime'. The EA publishes details of these stress tests.[98]

The stress tests for Q3 2012 to Q1 2013 were for example:

- scenario 1: spot prices are $250/MWh for the entire quarter compared to a base case of $100/MWh (reflecting a sustained national drought); and
- scenario 2: spot prices are $10,000/MWh for 8 peak hours during the quarter compared to a base case of $100/MWh (reflecting an unexpected short term capacity shortage).

The information to be provided in the spot price risk exposure statement includes the participant's annual net cash flow from operating activities, the estimated value of electricity that it expects to sell/purchase, a statement as to whether the participant has an explicit risk management policy in place in respect of its exposure to the wholesale market and the participant's 'target cover ratios' for each stress test.

These target cover ratios must be calculated in accordance with methods set out by the EA. They represent a measure to test financial stress arising from the stress test

93 See Subpart 5A of the Code

94 See: http://www.ea.govt.nz/our-work/programmes/priority-projects/stress-testing-regime-implementation/

95 *Spot rate exposure - Results of the stress testing regime*, Final report, Electricity Authority, 16 April 2013, p1.

96 Ibid.

97 See: http://www.nzxgroup.com/energy/stress-test-registrar

98 See: http://www.ea.govt.nz/industry/security-of-supply/stress-testing-regime/stress-tests/

scenarios. One example is a 'cover ratio', which intends to indicate how easily the firm would be able to pay for the costs caused by the scenario, using the revenue caused by the scenario. The other two ratios measure how much stress the scenario would impose on a participant's annual net cash flow and on its balance sheet.

The registrar publishes aggregate information on the basis of spot price risk disclosure statements received. It also sends summary data to the EA, which also publishes a quarterly report with stress test results.[99] The EA cannot identify individual participants.

Participants must provide the EA with a certificate on an annual basis, confirming that the information included in the quarterly spot price risk disclosure statements was correct. This certificate must be signed off by senior officials in the company.

99 See: http://www.ea.govt.nz/industry/security-of-supply/stress-testing-regime/quarterly-reports/