

International Power Australia and Loy Yang Marketing

Submission to the AEMC
Comprehensive Reliability
Review

Interim Report dated March
2007

May 2007

Summary

International Power Australia (IPRA) and Loy Yang Marketing Management Company Limited (LYMMCo) make this second joint submission reflecting their common views regarding the risks to market sustainability and long-term provision of reliability under the current NEM arrangements.

This submission reviews the key elements of the Comprehensive Reliability Review (CRR) Interim Report (CRR-IR). Our key interest remains the ongoing efficient operation and sustainability of a competitive electricity market, which is potentially jeopardised by a range of policy and regulatory initiatives.

We make the following key points in our submission:

- We strongly support the holistic approach the CRR has adopted in relation to market sustainability (sustainable markets will lead

to reliable markets)

- We support and encourage the facilitation of a stronger DSM to achieve a “two way” market.
- We support the Reliability Panel’s (RP) assessment that there is a risk that the reliability standard will not be achieved due to insufficient investment.
- In the main, the suggested options for changes to the reliability mechanisms are not supported without more work being done. A more regimented approach to define the problem and success criteria before developing potential solutions and assessing their efficacy is advocated.
- We suggest a much sharper focus on market robustness is warranted in the face of government policies and initiatives (greenhouse gas reduction policies and measure, state development agendas etc.)
- We offer strong support to the general direction taken by the CRR but suggest a better definition and analysis of the potential impacts of policy and regulatory externalities on market sustainability and reliability. Only then will it be beneficial to develop and assess potential solutions.
- The existing Reserve Trader arrangement needs to be examined in the context of market sustainability. The emergency reserve trader concept needs to be developed further and we offer a set of design criteria for such a function to assist the process.

In order to effectively deal with the complex issues surrounding the existing EOM, it is suggested that the Reliability Panel adopts a three step process as follows:

- 1) Identify and define the problem(s) and quantify impacts
- 2) Develop a set of criteria and measures for assessing potential solutions, and
- 3) Develop solutions, quantify their impacts and assess against the established criteria

In our view further work is required to demonstrate that the fundamentals of the market are sound and to analyse in detail the impact of the “other policy settings” on the market and investor confidence.

Introduction

International Power Australia (IPRA) is the largest private investor in electricity generation in Australia. Loy Yang Marketing Management Company (LYMMCo) trades the largest privately-owned generator in the NEM. The partial owner of Loy Yang Power (AGL), and the owner of International Power Australia (International Power plc), one Australian, and one international, are two of the private investors that have persisted in investing in the Australian NEM while others have exited.

The outcomes of the CRR-IR are directly relevant to sustainability of ongoing investments in this market, and the regulatory and sovereign risks that face investors.

These two businesses have prepared this second joint submission to the Comprehensive Reliability Review (CRR) as they share a common interest in the sustainability of the NEM market, and a common concern that it may not be achieved under current arrangements.

These specific issues relating to the broader questions of market sustainability have been opened for discussion in the CRR-IR. These are critical to the on-going development of the NEM energy only market (EOM) and are to be commended.

Establishing context

A number of detailed comments and recommendations have been made in our submission; however these need to be framed in the context of the key issues surrounding the NEM EOM.

The current market EOM design and operation is complex, has many drivers and feedback loops and we consider that its long-term sustainability (at least without reversion to state ownership) is quite fragile.

The overarching NEM objective is: ***“To promote efficient investment in, and efficient use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality, reliability, and security of supply of electricity and the reliability, safety and security of the national electricity system”***

We assert that many of the current government policy initiatives are in conflict with the longer term market sustainability and hence are not in the long-term interests of the consumers. Some examples of these are as follows:

- The impacts of on-going government ownership Identified by ERIG (risk, borrowing rates, asset values etc)
- Alleged early construction of plant in Queensland; and most significantly
- The plethora of greenhouse measures that subsidise and encourage early new entry

Some of the fundamental characteristics of the EOM are as follows:

1. The forward curve is essentially capped in the longer term by the new entrant costs.
2. The inter-linked nature of the market, the shape of demand- and price-duration characteristics, and the ‘lumpy’ nature of investment in what is still a relatively small market, mean that the trading arrangement is very sensitive to the new entry timing and sizing. Decisions on one plant in one region impact most of the market due to a common (and linked) clearing price.
3. To achieve revenue adequacy (fixed costs) the market relies on infrequent and relatively short periods of scarcity pricing (at or near VoLL). More significant events that contribute to fixed costs may occur (on average) as infrequently as one year in ten.
4. Demand is uncertain (weather dependant) and plant mix will significantly influence market outcomes.

In order for the EOM to be sustainable and reliable, it is essential that the majority of prudent and efficient investors are able to achieve

revenue adequacy on their investments. This requires the following conditions to be satisfied:

- New entry must be reflective of the true commercial cost and must not be subsidised (ie free from - costs held artificially low due to cross subsidies, un-commercial rates of return, subsidised fuel costs etc)
- New entry timing must be based on commercial decisions of market participants with the objective of achieving post-entry revenue adequacy and not be driven by externalities to the EOM.
- Price signalling must be preserved to drive effective demand side response or capacity augmentations in the longer term.

According to the ESIPC and CRR modelling studies, the EOM has the potential to be sustainable and to deliver the required level of reliability **if and only if left alone**. However this condition has not been satisfied to date and is highly unlikely to be satisfied in the future.

Currently the EOM subjected to the following “headwind” issues. The likely impact of these issues on the fundamental properties of the NEM is identified

- **Reliability perceptions** - Commercial interests and government drivers are in conflict. Governments (understandably) like to see new plant introduced early to give them comfort that the market is working and will produce reliable outcomes. In contrast, commercial investments tend to occur late (just in time). This represents an efficient market outcome but is probably not an acceptable one. (Impacts 2,3,4 above)
- **Greenhouse policy initiatives** – Measures such as MRET, VRET, NSW GGAS, Queensland Gas Obligations – GAC, soon to be introduced NRET and VEET, and others, essentially translate into a subsidy for new entrants and some existing plant, (capital or fuel cost) and have the tendency to introduce new plant early (design feature of the schemes - glide path). There will also be an impact on the residual demand profile, which impacts the remainder of plant mix in the NEM.

The non-firmness of wind generation in particular negatively impacts the contract-generator dynamics in the spot market. Some new technologies such as solar, geothermal and clean coal are being developed and are subsidised into the market. The combined impact of such initiatives impacts on all the market fundamentals.

- **Price volatility** appears not to be an acceptable outcome from a political perspective, and volatile prices are subjected to on-going surveillance by the AER exposing participants to the risk of regulatory intervention. (Likely to impact 3 above)
- **Supply scarcity** - USE which results from normal market operation remains politically unacceptable, and scarcity pricing encourages intervention by politicians or regulators. Hence the fundamental means for remuneration of the fixed cost of generation investment is diminished. (Impacts 2, 3, 4 above)
- **Cost of new entry** – Government owned entities are perceived to have lower risk profiles and are able to access lower cost of capital compared to privately owned businesses. This creates an uneven playing field (investment risk) and runs the real risk of generation being developed sub optimally. (Impacts 1, 2 above)

- **Transmission Pricing and access** – Generator access to reliable transmission is fundamental to efficiently meeting the supply demand balance. The current access arrangements do not include effective performance obligations on TNSPs and leave the generators to face risks beyond their control. This typically impacts the volume of contracts able to be offered into the market, and hence reduces efficiency.
- **Market design vs Market implementation** - Implementation of the NEM with average prices on a regional basis may mute operational and investment signals for generators, (in theory and putting aside risk issues, for maximum efficiency generators and loads should see nodal prices). Regional pricing, together with the lack of appropriate transmission pricing signals may lead to a bias towards transmission development and consequent inefficient investment in generation leading to higher delivered costs to consumers despite lower energy prices. These lower prices would threaten market sustainability and hence reliability.
- **Issues raised by ERIG** – as noted by the RP there are a range of outstanding market implementation issues which give rise to political risk for private participants and regulatory risk for generators which could impact on reliability. Although they are properly not issues that can be readily addressed by the RP in our view the Panel should more fully consider their likely impact on reliability.

In summary, the current NEM-EOM is at the crossroads, either a multilateral agreement to prevent any interference is reached by the jurisdictions and regulators, in which case NEM continues; or interference/intervention is accepted as inevitable, and the market design is augmented to ensure it remains reliable and sustainable.

It is suggested that a pragmatic approach would adopt the second path, since the likelihood of achieving the first path precondition is negligible.

In this context, the CRR-IR is seen as an extremely important step in the NEM review process. A key review criterion is to ensure that the trading arrangements are robust and tolerant of likely government and regulatory interventions.

For example the reserve margin desired by regulators or governments, or greenhouse policy initiatives subsidising cleaner/renewable generation (however desirable from a societal viewpoint), should not jeopardise the viability of existing NEM investments which ultimately are the providers of current electricity supply reliability.

Detailed response

We address the key issues raised in the interim report, as follows:

1 ***Reliability Standard and its Interpretation – Statistical approach***

Reliability Standard

The Panels view that the current form level and scope of the reliability standard should remain and that the standard be maintained on a NEM wide basis is generally supported, (ie the reliability standard should be a forward looking (10 year) USE target of 0.002%).

Interpretation of the reliability standard – statistical approach

The objective of the reliability standard is to manage the risk of market failure which may arise through excess or insufficient reliability, where in the medium term generators or customers respectively bear the cost of intervention or lack of supply. The assessment of the reliability standard must be forward looking where the need for new investment is signalled in a manner that is consistent with the commercial drivers for investment. This must occur in a time frame that allows the market to respond rather than on a conservative short term basis that encourages unnecessary action by NEMMCO that is unlikely to be effective.

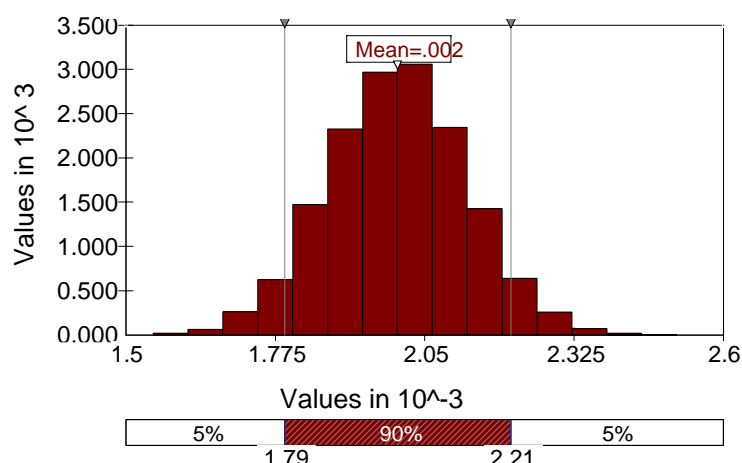
In order for the reliability standard to achieve this objective, further developments of both the measurement and interpretation of the unserved energy target are required. Currently interpretation of the standard is conservative and must be better defined (this could also necessitate a rule change).

Misunderstanding or misinterpretation of the target is likely to compound the current conservative approach in its application and operationalisation. It is strongly suggested that a probabilistic approach be used whenever dealing with the reliability target or measures.

10 year period consideration - For example, if the 0.002% USE target is defined as a 10 year average and the distribution of the USE average for the period was approximately normal (most likely to be the case as a result of the central limit theorem), then 50% of the 10 year averages would be expected to be greater than the average USE target.

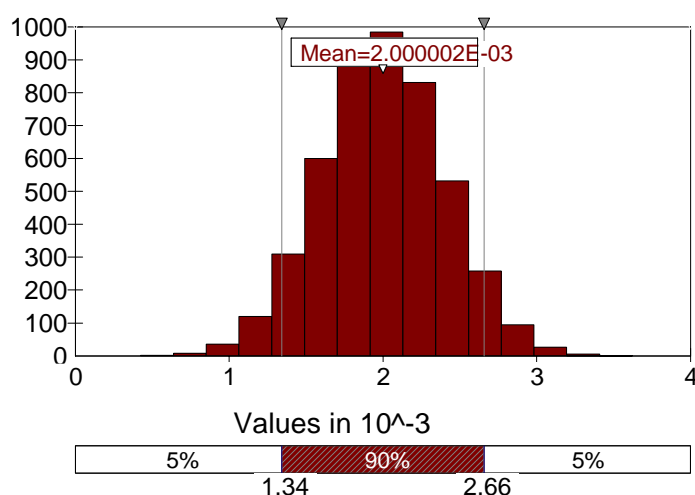
The following graph illustrates an example where the mean is 0.002%; and the standard deviation is 0.0004%, over 10 years, but there is a 50% probability of USE being greater than 0.002% and 5% probability of USE exceeding 0.0022% in any one year)

Distribution of the 10 year average USE



Annual considerations - The individual annual outcomes would be expected to deviate from the mean by larger amounts than the 10 year average USE. (Graph shows annual USE distribution, mean = 0.002; Standard deviation = 0.0004%; 50% probability of USE >0.002% and 5% probability of USE > 0.00266% - this represents a 33% increase above the average)

Distribution of the annual USE



The current approach used by NEMMCO is biased since it does not recognise the statistical nature of the sample mean and acts to cut off the right hand tail of the distribution (ie 50% of the time if the distribution was Gaussian). In order for both the target and measurement to be meaningful it needs to be defined in terms of probability of exceedence (ie probability of the right hand tail).

- Firstly the average of the USE over the 10 year period should have a probability of exceedence specified. Since this is a probability it could potentially be different between regions.
- Secondly a set of control intervals should be determined and annual reports should be set in this context.
- Finally action should only be taken if the measurement is outside of the control interval.

Recommendation:

Definition and methodology - It is suggested that an approach which embodies the probabilistic features described above is incorporated in the assessment of the supply required to meet reliability target or measures. These improvements to the current approach have been recommended by MMA in 2006, and ROAM Consulting in 2005 in their reports to the NGF (www.ngf.com.au). The improvements required include a probabilistic approach generally as described above.

Extreme events - In our view if a change is made to the interpretation of the standard as described above the recommendation in the CRR-IR p79, section 8.2, item 5 is not required. Further there is a significant risk with this proposal is that a very low probability event will be examined in great detail and out of context. This in turn will drive the media and governments to over-react. Whilst the examination of the “weak spots” is supported, dissection of and publication of specific events is not.

2 Public policy and regulatory factors - Market sustainability issues

We agree that this is the key question for the review and support the work the Reliability Panel has undertaken in taking a much broader approach, than has historically been the case in examining reliability in the NEM. The RP has examined both the:

- fundamentals of the market design, and the
- external risks which may impinge upon sustainable outcomes for participants and hence negatively impact reliability

We note the Panel’s observations on these matters (page 43) which have been summarised as follows:

- The fundamentals of the market design are sound and, with the current settings, the reliability standard is likely to be met in the near term, provided the fundamentals occur in practice; and
- However, there is increasing risk, in the medium to long term, that reliability may be compromised if reduced investor confidence as a result of uncertainty about other policy settings created potential delays with new generation investment.

We agree both issues will impact long term reliability. However in our view further work is required to demonstrate that the fundamentals of the market are sound and to analyse in detail the impact of the “other policy settings” on the market and investor confidence.

The report tends to focus on solutions which are essentially to address market failure. In our view the RP should be more forward looking, identify the factors that are likely to impact negatively on reliability and be recommending solutions.

Having identified such factors, an added benefit would be to provide a warning to policy makers regarding the consequences of their actions. Should the policy be implemented regardless, then the solutions identified by the RP could become an integral part of the new policy.

Fundamentals of the market design for reliability

As the RP has noted (p 23) the following settings are managed by the RP because of the inability of consumers to send accurate and effective signals at the price level at which they are willing to curtail demand.

Consistent with the current approach to its charter the Panel has focused primarily on examining the reliability settings which comprise the following:

- the reliability standard – currently = 0.002%, and the reliability mechanisms, which include
- Price mechanisms
 - VoLL and
 - CPT (a risk mitigation measure to limit participant risk from extreme events); and
- NEMMCO intervention mechanisms (the safety net).

The RP has found that the fundamentals are sound (which we question) and the bulk of the report is related to “safety net” mechanisms which were intended as emergency intervention mechanisms only (page 8) and would presumably be implemented prior to, or to prevent, market failure, or in the more extreme cases after the EOM has failed. (Refer CRR-IR table 6 page 69 where except for the consideration of the level of VoLL the primary focus is on alternative reserve mechanisms)

NEM Implementation

In our view the analysis of the market fundamentals is incomplete and should be expanded to consider (in the absence of external policy intervention) whether the EOM implementation is robust or could be improved.

Most modelling of the NEM including that carried out by CRA or the CRR includes a number of assumptions that simplify the modelling such as steadily increasing demand profile, average long run new entrant costs, and static load shapes. After carrying out modelling on that basis the RP notes (on page 8) that;

“Quantitative modelling indicates that spot prices would be just sufficient to signal the need for new investment in the absence of distortions due to the influence of external policy mechanisms such as greenhouse measures or retail price caps.”

In reality the simplified inputs identified above are dynamic and driven by externalities such as weather and climate change and national and international economic supply and demand all of which will increase the volatility of NEM outcomes.

In our view if NEM investment signals are “marginal” under the circumstances modelled, before assessing the sustainability of the NEM design to the “*the influence of external policy mechanisms*” (refer below to the section headed “Investor Confidence - External risks”) the modelling of the NEM viability should be expanded to consider at least the following;

- Weather or climate driven demand volatility,
- The impact of the potential for mismatch between supply and demand curves,
- A range of new entrant costs, and a
- Range of discount rates (government owned and private).

Outstanding Implementation Issues

We note that there are a number of outstanding market implementation issues which can fall into two categories.

a) ERIG - As noted in the RP report, there a number of implementation issues that have been raised by the ERIG review and are under consideration or action by the MCE. Although these matters could impact on reliability they are properly not issues that can be readily addressed by the RP. However the RP should consider the likely potential impact on reliability.

b) Transmission related - There are implementation issues under consideration by the AEMC and not yet resolved. These include

primarily the Congestion Management Review (CMR) and transmission price signals for generators which will encourage efficient investment in generation and transmission in the long term. (This was also considered in the ERIG report page 179).

We would like to draw the Reliability Panels attention to a report carried out by IES for a group of generators (the report is available on the AEMC website www.aemc.gov.au¹). The report was carried out to demonstrate the how zonal SRMCs and LRMC transmissions prices to new generators would increase NEM efficiency and reduce the total cost of supply to consumers. These price signals optimised both transmission and generation investment costs. This study is also relevant to reliability as it demonstrates that in the absence of such an arrangement it is likely that supply and demand profiles will match in a far less than optimal manner resulting in lower than expected returns to investors, which may result in delays in generation investment which then threaten reliability. Proper implementation of the NEM will result in a market that is more robust to external factors.

A NEM design which appropriately rewards efficient investment will provide a sustainable and reliable market.

Investor Confidence - External risks

The CRR-IR has identified a number of external risks, these risks include public policy issues such as;

- retail price caps and greenhouse measures such as,
- MRET, VRET, NGAC, Queensland gas – GAC, and soon to be introduced NRET and VEET.

In our view the analysis (market modelling) undertaken by the CRR should be expanded to quantify the impact of these external risks on the EOM. In addition the relationship between these risks and the solutions proposed should be identified to ensure that any changes considered are effective in meeting the design objectives.

For example, modelling the penetration of wind into the market may identify the depressive effect wind has on regional prices, contract market dynamics and generation sustainability, despite wind offering a little contribution to reliability due to its intermittent nature.

It is not clear from the RP's report that the alternatives proposals put forward for consideration will address the external risks identified in the report except in the case that the current market design fails. The following section deals with additional details.

3 *Reliability Management by the Reliability Panel – Improved role and process needed*

The CRR-IR modelling finds that the pricing signals are likely to be sufficient to deliver new investment in the absence of policy/regulatory intervention. However, policy and regulatory interventions, including the plethora of greenhouse measures (state and federal), delay the introduction of conventional generation and risk impairment of asset values and undermining investor confidence.

IPRA and LYMMCO are in agreement with the CRR that the market reliability/sustainability is at risk under such measures. However it is felt

¹<http://www.aemc.gov.au/electricity.php?r=20070416.102156> “International Power LYMMCO InterGen (Australia) TRUenergy AGL Hydro Tasmania Flinders Power Supplementary Submission On Future Efficiency Gains 22 December 2006”

that a better definition of the likely problem is necessary prior launching into the development of potential changes to the reliability settings and mechanisms.

The CRR_IR suggests several potential changes to the reliability mechanisms ranging from adjustments to existing trading arrangements through to a complete market redesign. We support the RP in canvassing the broadest possible range of changes that could be considered. We have assessed these potential solutions against the range of risk factors, identified by the Panel, as likely to impact the market. In addition IPRA and LYMMCO have identified additional risk factors and included these in the analysis. The risk factors fall into the following categories:

- Public policy issues;
- Greenhouse measure and
- Market implementation issues

The results of this assessment are summarised in Table 1 in the Appendix. This cursory analysis suggests that the solutions proposed don't address the complete range of factors impacting the market and as such appear out of context.

Recommendations

In our view, the option of introducing a new form of reliability ancillary service (RAS) has the potential to distort the current EOM, exhibit extreme price volatility and create an additional "unsustainable" market. This proposition also fails to remunerate all of the underlying capacity that enables reserve to function, and thus evokes the potential for migration from energy to reserve at the margin. Further, we doubt that it meets the market objective, since it does not contribute to sustainability.

Neither are our two businesses irreversibly committed to a specific form of capacity payments. However, we strongly contend that the impact of the issues being addressed by the Panel demands that these options be given equal time in the Panel's consideration, and subjected to the same vigorous assessment.

In order to effectively deal with the complex issues surrounding the existing EOM, it is suggested that the Reliability Panel adopts a three step process as follows:

- 1) Identify and define the problem(s) and quantify impacts;
- 2) Develop a set of criteria and measures for assessing potential solutions; and
- 3) Develop solutions, quantify their impacts and assess against the established criteria.

4 Will the reliability standard continue to be achieved with the current level of VoLL?

The RP has demonstrated that in an ideal market that the current level of VoLL in the long run is at an appropriate level to achieve the reliability target.

Whether in practice this calculation is relevant or not is not clear as changes in new entrant cost is only one of the factors that may be relevant to the level of VoLL.

As noted in the CRR-IR report, market implementation is not "ideal". Whether the level of VoLL is appropriate or not depends not only on new

entrant costs but also on demand volatility (driven by weather and climate variability) as well as supply side performance resulting in less than optimal supply and demand mix. These variations have only been considered to a limited extent in the modelling. All of these variables are assumed to be internalised in the NEM design by allowing the exercise of market power, (bids up to the level of VoLL), with contracting to stabilise revenue and customer prices and new entrants to cap market prices. Consequently the theoretical calculation, on the appropriate level of VoLL, may not be relevant.

The level of VoLL and the CPT provide a cap on participant risk; increasing VoLL increases participant risk. The linkage to new investment from this risk is tenuous.

In relation to reliability performance to date the Panel has noted;

“The Panel observes, however, that the NEM’s reliability performance has, historically, been bolstered by generation capacity overhang in some regions. This has perhaps made the reliability standard an easier benchmark to perform against than would otherwise have been the case in a system starting with a tighter supply-demand balance.”

Given the generation overhang the reliability mechanisms have not been tested and it has not been demonstrated that VoLL should be increased.

In our view we support the RP’s draft conclusion not to change VoLL since a case has not been made for change.

5 **Future of the reserve trader**

At the start of the NEM EOM it was prudent to introduce an emergency safety net when entering into new and substantially untested market. At that time, a significant capacity overhang existed and intervention by the reserve trader was considered remote and a sunset clause for the arrangement was set.

However circumstances have changed and the market has now been in existence for almost a decade and the NEM has recently experienced several costly interventions by NEMMCO in their reserve trader role.

Some of the detriments are as follows:

- By the very virtue of the existence of the Reserve Trader, participant behaviours and actions are likely to be altered;
- It impedes the demand side response;
- It provides incentives to withhold capacity in order to receive additional revenue; and
- Capacity sought is in excess of what the market customers are willing to contract.

Whilst we understand the need to make an emergency mechanism available to deal with the prospect of market failure, we don’t consider the existing arrangements are effective or desirable.

Currently there is insufficient detail to meaningfully comment on the proposed emergency reserve trader alternative as canvassed in the CRR-IR.

We propose a guiding set of design principles for the emergency reserve trader intervention mechanism:

- Should not impede normal market signals;
- Should not provide distortion incentives to market participants;

- Must have a very high trigger level to make it a true emergency instrument;
- If invoked, should be interpreted as a market failure and dealt with as such; and
- If necessary be implemented as a transitional arrangement prior to a more substantial and holistic redesign of the market.

6 ***Timing of future reviews***

The question market sustainability is a complex and challenging question. The external environment is dynamic, with greenhouse gas abatement policies in a state of flux. Low rainfalls and recent water scarcity resulting in high pool and contract prices have sensitised customers, governments and industry observers to the dynamic nature of the NEM EOM.

We are of the firm view that it is essential for the AEMC/Reliability Panel to be proactive by assessing potential problems, seeking pragmatic solutions, making firm recommendations and consistently and tirelessly seeking to prevent major future problems and market failures.

It is suggested that the market sustainability/reliability must be addressed without delays and the CRR should go onto stage 2, quantifying the problems and facilitating a process to develop solutions.

It must be stressed that improvements to the trading arrangements is a continuous process that should not rely on "spot checks" every few years.

Appendix – Table 1 Comparison of Risks with Proposed Solutions

The relationship between risk and solution in the interim report is not clear. The following table attempts to address the relationship between the risk identified and the solutions proposed, ie answer the question “Is the proposed solution addressing the risk?”

This table does not address the issue of whether a particular solution that appears to match a problem could be implemented or be effective.

RISK	PROPOSED SOLUTIONS					Comments
	Adjust the reliability standard	Raise VoLL	Facilitate longer term contracting	New mechanisms and revenue streams for reserve plant	Market redesign – implementation of capacity remuneration	
Public policy Issues						
Retail price caps	NA	NA	NA	NA	? Market redesign to address external market distortion	
Other?						
Greenhouse measures						
MRET	NA	NA	NA	NA	EOM not sustainable Market redesign required	These distortions may increase short term reliability but threaten long term sustainability
VRET	NA	NA	NA	NA	As above	As above

NRET	NA	NA	NA	NA	As above	As above
NGACS	NA	NA	NA	NA	As above	As above
Carbon Trading	NA	NA	NA	NA	NA	EOM may be sustainable with appropriate implementation of Carbon Trading regime
Other?						
Market Implementation issues						
Contract duration too short	NA	NA	Root cause of problem addressed specifically	NA	NA	
Absence of DSM and inelastic demand (2.4)	NA			Root cause of the problem may be addressed by this solution if EOM by itself doesn't		
Other?						
Market Implementation issues not addressed						
Demand variability	NA					Impact on market sustainability needs to be quantified

New entrant cost variability	NA					As above
Mis pricing	NA					As above
Less than optimal plant mix	NA					As above