

**5 / 30 Issue**

# **Final Report**

*Prepared by: Market Development*

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## Executive Summary

NEMMCO has completed two work streams involving analysis of the 5/30 issue and the investigation of options to address this aspect of the NEM design. This report represents NEMMCO's final report into this issue.

The impact of the 5/30 issue has been examined and documented<sup>1</sup> by the industry working group<sup>2</sup> convened by NEMMCO to assist it to investigate this issue. A number of options were identified by the working group. They were subsequently reduced to a nominated option – “5 minute Dispatch and Simulated 5 minute Settlement” which was then evaluated using a cost benefit analysis. Costs involved in implementing the option were identified by the working group members for their representative industry sectors and the efficiency benefits to the market were analysed through simulation modelling carried out by McLennan Magasanik Associates (MMA).

A draft final report on the 5/30 issue was published by NEMMCO in June 2002 which presented the results of the cost benefit analysis of the nominated option. The report findings indicated that the costs of implementing the nominated option exceeded the efficiency benefits by a considerable margin and that NEMMCO therefore could not recommend implementing the option to address the 5/30 issue based on its consideration of implementation costs and market efficiency benefits.

Submissions were invited on the draft final report with the consultation period closing on 16 August 2002. 13 submissions were received by NEMMCO in response to the consultation. A number of submissions raised issues regarding the implementation costs and the modelling of efficiency benefits. Some other issues were also raised.

In order to respond to the issues raised in submissions, NEMMCO obtained further information on the modelling of efficiency benefits from the economic consultant<sup>3</sup> and re-considered implementation costs. NEMMCO's consideration of the issues raised is detailed in this paper, and the outcomes are summarised below.

Investigations carried out by NEMMCO to address the issues raised in submissions to the draft final report resulted in the following findings:

- The modelling methodology and assumptions used in the assessment of the efficiency benefits performed by MMA are considered by NEMMCO to be reasonable;

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<sup>1</sup> Working Group documentation including a definition of the issue and options identified to address the issue may be obtained from the NEMMCO Infoline or found on the NEMMCO website at: URL <http://www.nemmco.com.au/future/design/1182.htm>

<sup>2</sup> The 5/30 Working Group was convened by NEMMCO to assist its analysis and identification of options to address the issue. Working Group members were nominated by industry sectors on the request of NEMMCO and where possible industry groups were involved such as the NGF, NRF and the Energy Users Association of Australia.  
URL: [http://www.nemmco.com.au/operating/groups/5\\_30\\_dispatch/140-0004.htm](http://www.nemmco.com.au/operating/groups/5_30_dispatch/140-0004.htm)

<sup>3</sup> MMA report titled “Reply to comments on the Benefit/Cost Study of the 5/30 Anomaly” 11 February 2003 is available on the NEMMCO Website at the following URL:  
<http://www.nemmco.com.au/future/design/1182.htm>

- Implementation cost estimates for the nominated option were quantified in good faith by working group members and whilst being subject to some variable assumptions, remain high following a verification of key cost components such as the IT costs that would be faced by retailers;
- Economic advice obtained by NEMMCO regarding benefit / cost studies has indicated that expected efficiency benefits should exceed implementation costs by a considerable margin in order to support change to NEM arrangements, particularly when implementation costs are irreversible (such as IT and other systems changes); and,
- A compelling case has not been demonstrated that expected efficiency benefits will exceed the costs of implementing the nominated option by a significant margin.

Following a full consideration of the 5/30 issue, and of issues raised in submissions to the consultation, NEMMCO concludes that there is not a compelling case to show that the efficiency benefits will outweigh the costs of implementing the nominated option.

The key recommendations contained in NEMMCO's draft final report remain unchanged as follows:

**(a) Benefit / Costs Analysis:**

NEMMCO has reviewed the outcomes of the benefit / cost analysis undertaken to evaluate the 5/30 issue following consideration of submission issues.

NEMMCO is satisfied that the evaluation of both costs and benefits are reasonable.

**(b) Alternative Option:**

*“Option 2.2 was considered undesirable for a range of reasons including its potential impact on the financial markets. This option should be discarded.”*

Market participants did not dispute this NEMMCO conclusion in their submissions.

**(c) Financial Market Impacts:**

Further consideration of the impact of the nominated option on financial markets by MMA has indicated that some benefit may be received by market customers in reduced hedge premiums. These gains however, should be offset by an equivalent payment by market customers under the levy imposed by the preferred option.

NEMMCO is satisfied that the evaluation of efficiency benefits is consistent with its terms of reference and evaluation criteria, and that the impact on financial markets has been appropriately accounted for in the modelling carried out by MMA.

**(d) Impact of Financial Transfer Payments:**

NEMMCO has confirmed that transfer payments do not constitute changes to market efficiency and should not be included in its assessment criteria. Stakeholders may wish to pursue changes with parties that are in a position to apply broader criteria to the assessment than NEMMCO.

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## 1. Matter under consultation

This consultation relates to assessment of the merits of progressing potential changes to the NEM to address the issue that has become known as the 5 minute / 30 minute issue, or the 5/30 issue. The 5/30 issue is the result of the current NEM design whereby dispatch occurs on a 5 minute basis whilst settlement occurs on the basis of 30 minute average prices.

The 5/30 issue has, for some time, been considered a source of inefficiency in the NEM. Through this package of work, and with the assistance of an industry representative group NEMMCO has identified and quantified the efficiency loss to the NEM that can be attributed to the 5/30 issue, and has assessed the net benefits of progressing changes.

This is the final report of a consultation process that has sought industry comments on the findings of the investigation prior to NEMMCO finalising its position on whether it will promote changes.

## 2. Background to matter under consultation

This report completes the second major stream of work by NEMMCO and industry representatives into analysis of the 5/30 issue. The earlier work stream was completed in March 2001, and concluded that further work on the issue was justified at that time to identify the options for solving the 5/30 issue and consider the benefits of progressing them. Material relating to that earlier work stream is available from the NEMMCO Information Centre<sup>4</sup>.

A working group process involving representation from industry sectors was used by NEMMCO in this second work stream to review the 5/30 issue in accordance with its Code objective<sup>5</sup> *“to promote the ongoing development of, and changes to, the national electricity market with the objective of continually improving its efficiency”*.

Prior work by the 5/30 Working Group resulted in understanding and documentation of the 5/30 issue, and its impact on various market participants as well as the identification and preliminary evaluation of options to address the 5/30 issue. Two nominated options were then evaluated using a benefit / cost analysis with working group members identifying the costs of implementation for their respective industry sectors. An independent economic consultant was engaged by NEMMCO to model and evaluate the market efficiency benefits attributable to the nominated option.

NEMMCO recently published a draft report<sup>6</sup> containing the findings on its benefit / cost analysis of options to address the 5/30 issue. Analysis by an independent economic consultant, of the market efficiency implications of the preferred option for resolving the 5/30 issue, found that material market efficiency benefits could be achieved, but that they were insufficient to outweigh the implementation costs.

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<sup>4</sup> Contact details for the NEMMCO Information Centre may be found at the following URL:  
<http://www.nemmco.com.au/about/contact.htm>

<sup>5</sup> NEMMCO Code objective: Clause 1.6.2(b) of the National Electricity Code.

<sup>6</sup> NEMMCO Draft Report titled *“5 Minute Dispatch and 30 Minute Settlement Issue: Draft Final Report”* may be found on the NEMMCO website at the following URL:  
<http://www.nemmco.com.au/future/design/1182.htm>.

NEMMCO published its draft report on the findings of the review in June 2002. NEMMCO concluded in that report that it would not propose changes to NEM arrangements in respect of the 5/30 issue, as a net benefit to the market had not been demonstrated. Stakeholder comment was sought, with the consultation period closing on 16 August 2002.

In response to the consultation, NEMMCO received 13 submissions<sup>7</sup> from interested parties. Submissions were received that both agreed with the recommendations of the draft report (5 submissions) and disagreed (8 submissions).

NEMMCO has now given detailed consideration to the issues raised in submissions, and in order to address a number of those issues, additional evaluation work has been carried out. This has included further clarification from the independent economic consultant as to issues raised in respect of modelling, and further work by NEMMCO to reconsider retailer implementation costs.

This paper addresses the issues raised in submissions to NEMMCO's consultation and presents NEMMCO's conclusions on the 5/30 Issue.

### Related Public Documents

Documentation of the 5/30 Issue, including information on the working group and associated reports is available from NEMMCO's Information Centre or from NEMMCO's website at the following URL <http://www.nemmco.com.au/future/design/1182.htm>.

In chronological order, the documentation published in this review included the following:

Document Title	Description
Terms Of Reference	Terms of reference for NEMMCO's review of the 5/30 issue
Project Outline	Project outline - NEMMCO's review of the 5/30 issue
Issue Description	A description of the 5/30 issue and the impact on stakeholders
Options Paper titled "Options for Resolving the 5 Minute Dispatch and 30 Minute Settlement Anomaly in the NEM", September 2001.	A summary paper presenting potential options identified by the 5/30 Working Group to address the 5/30 issue
MMA Issues Paper titled "Modelling of the Efficiency Gains from Resolution of 5/30 Issue", 28 January 2002.	Details the modelling approach to be employed by MMA to evaluate market efficiency benefits.
MMA Final Report titled "Benefits	MMA report evaluating the market

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<sup>7</sup> Submissions received in the consultation on NEMMCO's Draft Final Report on the 5/30 Issue are available on NEMMCO's website at the following URL: <http://www.nemmco.com.au/future/design/1182.htm>.

<b>Document Title</b>	<b>Description</b>
and Costs of Alternative Arrangements for Aligning Dispatch Prices and Settlement Payouts”, 22 May 2002	efficiency benefits from the nominated option and presenting the results of the benefit cost analysis.
NEMMCO Draft Final Report, 19 June 2002	NEMMCO’s Draft Final Report
Additional Information – MMA Report: “Financial Transfer Payments for the Base Scenario Modelled for the 5/30 Project”;	Supplementary report detailing the magnitude of financial transfer payment under the nominated option.
MMA Report: “Reply to Comments on the Benefit/Cost Study of the 5/30 Anomaly”;	MMA consideration of issues raised in submissions to NEMMCO’s Draft Final Report.
NEMMCO Final Report	This paper presenting NEMMCO’s final position on the 5/30 issue.

### 3. Consideration of consultation submissions

This section provides a list of the submissions received by NEMMCO in response to its consultation on the 5/30 issue. NEMMCO's consideration of the issues raised in submissions, subsequent analysis and NEMMCO's response to each individual issue is also explained in detail in this section.

#### 3.1 List of submissions received

Submissions on the draft report were received from the following parties.

Party	Stakeholder	Position (agree / disagree with recommendations in NEMMCO draft final report)
The NRF ( representing 11 NEM Retailers)	Retailers	Generally supporting the findings of the draft report.
Ergon Energy	Retailer	
Delta Electricity	Base Load Generator	
Macquarie Generation	Base Load Generator	
Incitec	End User	
The NGF – representing NEM generators	Generators	Raising concern with various aspects of the draft report, including modelling, implementation cost evaluation, and the conclusions.
Hazelwood Power	Base Load Generator	
Snowy Hydro	Hydro Generator	
Southern Hydro	Hydro Generator	
Hydro Tasmania	Hydro Generator	
TXU	Peaking Generator and Retailer	
TransEnergie	MNSP	
Joseph Winsen	Interested party	



NEMMCO has grouped the issues raised in submissions to the draft report into the following four areas:

- **Implementation Costs**            Issues relating to the estimation of implementation costs by stakeholders and NEMMCO;
- **Market Efficiency Benefits**    Issues regarding the modelling and evaluation of efficiency benefits that would be delivered by the nominated options;
- **Terms Of Reference**            The scope of the terms of reference for the NEMMCO review and assessment criteria; and
- **Other**                                Other issues including the evaluation process and scope.

Each of these issues is discussed in detail in the next sections of the paper together with NEMMCO's response to each issue.

## 3.2 Implementation costs

A number of issues were raised in submissions in relation to the evaluation of implementation costs for the nominated option, particularly in relation to the implementation costs for retailers. These included the following concerns:

- Concern that the process used to gather implementation costs was prone to bias and/or an independent expert should have performed the cost estimation;
- Concern that the reported retailer implementation costs were excessive, and that this may have been because:
  - The definition of “costs” was not appropriately detailed in the survey process used to determine retailer implementation costs;
  - Retailers may not have understood the options, with overly complex solutions having been costed, or discretionary costs having been included;
  - Retailer costs would have dropped due to recent mergers in the retail sector;
  - Retailer implementation cost estimates were performed at a time at which significant workload was experienced due to FRC concerns for retailers;

Each of these issues has been considered in detail by NEMMCO. The issues are described in further detail in section 3.2.2 together with the conclusion reached by NEMMCO on that issue.

The detailed analysis carried out by NEMMCO to address these issues is described in the next section.

### 3.2.1 Review of implementation costs

NEMMCO received numerous submissions raising issues in relation to implementation costs for the nominated option. These included detailed submissions from TXU, Southern Hydro, Hazelwood, Snowy, NGF and TransEnergie and represent the greatest area of concern expressed by respondents.

#### Aim of the review of implementation costs

NEMMCO undertook a review of the implementation costs for retailers in order to respond to concerns expressed in submissions to the draft final report. A summary of the process and findings of that review is presented in this section followed by a more detailed discussion of each specific issue.

In reviewing implementation costs, NEMMCO sought to fully understand the basis of the cost estimates provided by retailers. Comments from generators and other parties expressed disbelief that the implications of the nominated option could result in process and IT systems changes requiring an aggregate expenditure of \$160M+ in today's terms. NEMMCO therefore sought to answer the following broad questions:

- Why are the cost estimates so large?

- Is there a common and misunderstood aspect of the option that created significant costs?
- Were envisaged implementations in retailer IT systems performed in an unnecessarily complex way or a way in which unnecessary costs would be incurred?
- Has a least cost implementation been costed? Are simplified (and therefore less expensive) implementations possible?
- Have discretionary costs been included in the estimates? (eg gold plating solutions or involvement of non-essential systems)
- Given answers to the above questions, would revised costs estimates (if applicable) be sufficient to turn around the cost benefit analysis and the recommendation of 'no change' in NEMMCO's draft final report?

During the review of retailer implementation costs, further consideration of the implementation cost estimates for NEMMCO also revealed issues regarding some aspects of the nominated option. NEMMCO implementation costs are also discussed further in this section.

### **Process**

The NRF was formally approached by NEMMCO to participate in a review of the estimated retailer implementation costs appearing in the draft report. NEMMCO experienced considerable difficulties in establishing a process that would deliver robust evaluation with the important participation of a cross section of retail businesses. However, after some time, a process was progressed that involved NEMMCO conducting facilitated face to face and teleconference interviews with a number of retailers. This included retailers from different regions, and differing in franchise customer base and size. This process provided NEMMCO with a range of views and an opportunity to consider the consistency of responses.

NEMMCO IT staff intimately familiar with bulk IT and settlement systems (gained through involvement in FRC development work) took part in the process together with NEMMCO Market Development staff. Staff involved from retail businesses represented regulation/trading group views as well as business analyst and IT systems development. A facilitator from NEMMCO familiar with IT business process development and otherwise not related to previous work on the 5/30 issue, facilitated the investigations.

NEMMCO used the outcomes from this process to form its views on the retailer implementation cost estimates.

### **Outcomes**

The information on business systems and cost impacts supplied via the NRF retailer implementation costs survey process<sup>8</sup> was then reviewed in the interview process on an item by item basis including the impact of the nominated 5/30 solution on the following areas within the general business:

- Billing Systems;
- Data Management;

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<sup>8</sup> The Retailer implementation cost survey is described in detail in section 13 of NEMMCO's Draft Final Report.

- Energy Trading and sales and marketing systems; and,
- Settlement systems.

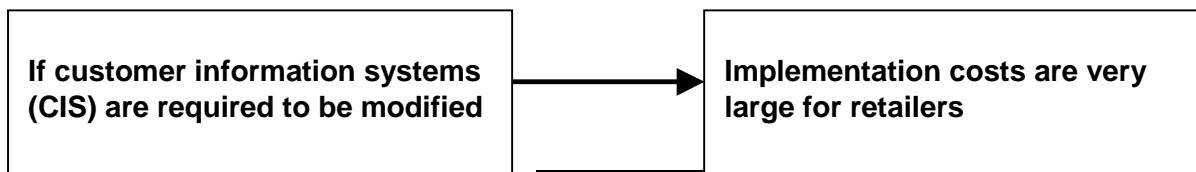
NEMMCO understands the NRF position to be that the identified modifications to IT systems, including customer information systems<sup>9</sup> (CIS systems), are required to support the nominated option for the following reasons:

- Retailers would need to utilise 5 minute profiled data for the purposes of settlements reconciliation and billing. Reconciliation of at least the larger customers' 5 minute data would need to be performed by retailers;
- Modifying supporting processes for forecasting and quoting for 5 minute settled customers;
- Identifying 5 minute settled customers in databases and systems to enable retailers to manage and report on residual customer pool exposures;
- Forecasting and hedging the residual customer base;
- Management of the pass-through of the settlements imbalance levy or ancillary service. It will be necessary to identify a subset of customers to whom the pass-through is to apply and to apply it to those customers accurately; and,
- Retailers would need systems that support customers who opt for the simulated 5 minute settlements of the nominated option to remain competitive.

Suggestions by NEMMCO (and previously by generators in submission to this consultation) that simple stand alone or ad-hoc systems could be used to manage issues related to the implementation of the nominated option were dismissed by the NRF on the basis that they manage highly automated and integrated IT systems. NEMMCO is satisfied that standalone systems or systems employing manual processing aspects could create unacceptable elements of errors and risk, particularly where large numbers of customers are involved. This is a decision that individual businesses need to be free to make.

In discussions with NEMMCO market systems staff, alternate implementation methods were explored which had the potential to reduce costs, including centralised databases managed by NEMMCO (or another party). Discussions with NEMMCO staff did not identify other implementation methodologies that would completely avoid the requirement to modify some or all CIS systems and still manage their business processes effectively. This aspect of the review of retailer implementation costs is critical to the outcome of this review, as the only way in which costs can be contained to a moderate level is to avoid changes to CIS systems. In addition, NEMMCO is satisfied that the costs identified involve reasonably justified rather than discretionary (non-essential) systems and costs.

Retailers argue strongly that management of 5 minute simulated data is required within their market systems under the nominated option to manage their businesses. This would necessarily involve the CIS systems. It is therefore expected that implementation costs would be large for the majority of retailers.



<sup>9</sup> Customer Information Systems (CIS) are mass market systems such as a billing or settlement systems for large numbers of customers. In IT intensive industries such as electricity retailers, CIS systems have electronic links through to many related business areas and systems.

In the case of very small retailers or retailers maintaining a limited customer base, costs could be expected to be somewhat smaller since the implications for forecasting, trading and quoting systems would be simpler due to their smaller size and simpler IT architecture.

### **NEMMCO views regarding retailer implementation cost estimates**

Following its investigations described above, NEMMCO has developed the following views in regard to the estimation of retailer implementation costs:

- Industry sector bias has not been a material issue in the work of the 5/30 Working Group in determining implementation cost. This is not to say that there are not uncertainties present in implementation cost estimates, or that strongly held views on the 5/30 issue are not present, but rather, that deliberate bias has not been an issue in this case and that the results previously presented may be considered credible;
- NEMMCO understands that there are significant complexities in retailer business processes and IT systems are critical for risk management and strategically important in remaining competitive;
- The bulk of retailer costs have arisen due to the involvement of customer information systems (CIS), which are required to manage information relevant to the nominated option. Alternate ways to implement the nominated option have been explored, but none has been identified to be a reasonable substitute. Therefore, CIS system modifications are involved and significant costs are to be expected.
- Some minor reductions in cost estimates for particular cost items were identified during the validation process. In addition, retailers noted that some incidental costs were not included in the original estimates.
- In order to reduce implementation costs to a level such that market efficiency benefits were likely to dominate, NEMMCO would need to have identified a reduction in retailer implementation costs by at least an order of magnitude. This was not the case and implementation costs remain significant.

Whilst some reduction in implementation costs for retailers were identified through the validation process, and the consideration of the reduced number of retailers through mergers in the retail sector (see section 3.2.2d), the total implementation costs to support the nominated option still outweigh the market efficiency benefits by a considerable margin.

### **NEMMCO implementation costs**

During more detailed NEMMCO discussions of IT system impacts of the nominated option, likely changes to NEMMCO's market systems to support the nominated option were also reviewed in detail. It became apparent that some of the functionality embedded within the nominated option may significantly increase NEMMCO's implementation costs above the estimates appearing in the draft report.

The nominated option uses additional data flows from appropriate metering sources in order to deliver 5 minute profiled volumes relating to generators and also to market customers who may choose to opt in to the simulated 5 minute settlement regime. The default metering arrangements to allow this process (SCADA data) are already in place for generators and some market customers and would need to be installed by other market customers if they so

wish (at their own cost). The option also envisaged that these parties may elect to install 5 minute interval metering (at their own cost) if they believed that it would be beneficial to do so.

NEMMCO's cost estimates were performed on the basis of utilising SCADA data sources. It is now evident that NEMMCO costs under this arrangement (approximately \$1M) were underestimated. NEMMCO market systems staff have since confirmed that if in fact, 5 minute interval data from any parties were needed to be managed by NEMMCO systems, then the implementation costs for NEMMCO would change significantly to the order of \$40M as significant portions of new FRC systems would require replacement or modification. This would be a massive change and in all probability, make the nominated option unviable due to NEMMCO costs.

This revision of NEMMCO implementation costs has design implications for the nominated option. In order to avoid incurring these potentially significant NEMMCO IT systems costs, the nominated option would need the optionality to use 5 minute interval metering removed from its design specification.

### **Benefits versus Costs – Economic Guidance**

As a last issue, NEMMCO requested economic guidance from MMA on the degree to which benefits would need to exceed costs to justify a firm recommendation for change being promoted.

MMA indicate that there is no clear guidance provided in economic literature, however, in the case of the 5/30 issue, the nominated option considered required significant and irreversible changes to market settlement processes as well as other changes to IT systems for NEM participants and NEMMCO.

Given that there is, at least in the view of some parties, uncertainty surrounding the evaluation of implementation costs as well as the modelling of market efficiency benefits then a large difference in favour of benefits over costs may be required in order to endorse implementing the nominated option.

### 3.2.2 Consideration of individual cost related issues

Implementation costs were the area of greatest concern for respondents as discussed in the previous section that described a retailer implementation cost validation process. This section presents NEMMCO's consideration of each issue individually.

#### (a) The process used to gather implementation costs was prone to bias and/or an independent expert should have performed the cost estimation

##### Summary of issue

This issue was raised by TXU and also strongly argued by Hazelwood. Their concerns lie with the fact that NEMMCO relied upon a process whereby working group members identified implementation costs for their respective industry sectors rather than an independent expert. They argue that this process has resulted in the estimate of implementation costs being influenced by vested interests in various outcomes and that NEMMCO did not deal with this predictable bias.

##### NEMMCO response

NEMMCO acknowledges this concern and has since taken steps to address it by carrying out further due diligence work with retailers as described in section 3.2.1 above. This work has focussed specifically on the issues raised in submissions, and had the aim of allowing NEMMCO to respond to submissions from a position that is as informed as possible.

Submissions focus critically on the retailer costs as this turned out to be the area where implementation costs were greatest.

It is acknowledged that there is a risk of biased results when identifying implementation costs for parties that have vested interests. In some circumstances an independent expert could be used to manage this risk. Consideration was given by NEMMCO at an early stage as to the manner in which implementation costs (and market efficiency benefits) may be assessed. It was considered that the process to assess market efficiency benefits required the skills of an independent economic expert. It was also recognised that working group members, with the assistance of others within their respective industry sectors would be best placed to identify business areas, processes and systems that would be impacted by the nominated option and to broadly assess the implementation costs.

In the event that re-examination of implementation costs was required due to a close benefit/cost balance, an independent expert could be engaged by NEMMCO to more finely analyse costs. NEMMCO considers that this latter stage was not warranted as implementation costs were shown to significantly exceed the market efficiency benefits.

In the case of retailers, due to the significantly different business structures, processes and IT systems in place from business to business, NEMMCO believes that the use of an independent expert would deliver similar or less accurate results to the NRF representatives co-ordinating a response from retail businesses directly.

On one hand, an independent expert would deliver some credibility in terms of objectivity, however, the expert would need to follow essentially the same process in gathering the retailer cost information. In addition, the independent expert would not have open access to the in depth knowledge gained by retailers regarding their IT systems following recent FRC

systems. In this case, NEMMCO is of the view that an independent expert would not have added a material improvement to the assessment of implementation costs in terms of their accuracy due, in part, to the diversity of retailer businesses.

To address the concerns of biased costing estimates raised in submissions, NEMMCO undertook a review of retailer implementation costs as described in section 3.2.1. That process made use of NEMMCO staff who had been intimately involved in the recent development of FRC systems for the market, and it revealed that previous cost estimates for changes to retailer systems were reasonable.

In summary, NEMMCO agrees that the involvement of industry sectors in identifying implementation costs was open to bias on both sides of the debate, however, the validation undertaken by NEMMCO of retailer implementation strategies and therefore the implementation costs indicates that bias has not been a material concern in this case.

**(b) The definition of “costs” was not appropriately detailed in the survey process used to determine retailer implementation costs.**

**Summary of issue**

Hazelwood Power and TXU expressed concern that retailers were asked to complete the implementation cost survey, which contained insufficient guidance material for them to effectively complete the survey. Hazelwood considers that the following information was required by retailers to understand what was being asked of them and to respond appropriately:

- The “meaning of cost” to be used in the retailer cost survey required detailed explanation; and,
- The context for cost estimates (the expected size of the levy to be passed on to retail customers) was required to be explained.

Hazelwood stated that the above information was not provided during the survey process, and TXU agree that the size of the expected levy is material to the implementation strategies selected by retailers.

**NEMMCO response**

In preparing the above retailer implementation cost estimate survey, a detailed explanation of the survey process was drafted by NEMMCO and the NRF representatives on the 5/30 Working Group. In addition, the NRF representatives on the 5/30 Working Group drafted a pro-forma response for retailers, which included typical business areas that may be impacted by the nominated option – as seen by the NRF representatives. The survey was distributed to retailers by the NRF.

The survey request and briefing material, together with an economic explanation of how the implementation costs for the retailer business should be interpreted were then supplied from NEMMCO to retailers via the NRF survey request.

NEMMCO is of the opinion that retailers clearly understood the interpretation of the term “costs” regarding implementation costs in the context of the survey and the 5/30 issue. The briefing material included an economic description of costs as well as how the implementation costs for retailers could be identified.



NEMMCO agrees with Hazelwood's argument that the "context" of the cost estimate was not initially provided to the retailers. It may have been of some assistance for retailers to know the approximate magnitude of the envisaged "market levy" or ancillary service associated with the nominated option prior to estimating the scope of changes.

To further consider this issue, NEMMCO has obtained and published the details of the size of the expected levy contained from MMA<sup>10</sup>. In that report, MMA indicates that the magnitude of the financial transfer payments was of the order of \$53.4M over eight years (or approximately \$78.6M over ten years).

The close date for the consultation period was extended by NEMMCO so that this data could be made available to interested parties and included in their submissions to the draft report if considered material. Retailers do not consider that the availability of the size of the expected levy has changed their views as to the scope of implementation costs to support the nominated option as they contend that 5 minute data is still required to be managed by CIS systems.

NEMMCO's validation of the retailer implementation cost estimates described previously in this paper has concluded that this issue is not material to the outcome of the cost benefit analysis.

**(c) Retailers may not have understood the options. Overly complex solutions have been costed or discretionary costs may have been included**

**Summary of issue**

TXU and Southern Hydro expressed concern that retailers may not have properly understood the option. TXU base this view on a number of potential cost item areas that were included in the survey pro-forma, such as "NMI configuration", "Revise TLF calculation model" and "Meter Upgrade and reprogramming". TXU consider these items as being irrelevant to an implementation of the nominated option.

TXU, the NGF and Hazelwood are concerned that overly complex solutions have been costed by retailers and/or that discretionary costs have been included. This would have the effect of inflating the implementation costs for retailers to support the nominated option.

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<sup>10</sup> MMA report titled "Financial Transfer Payments for the Base Scenario modelled for the 5/30 Project" 5 August 2002 may be found on the NEMMCO website at the following URL:  
<http://www.nemmco.com.au/future/design/1182.htm>

## **NEMMCO response**

Included in the information provided by the NRF to retailers for the retailer implementation cost survey was a thorough description of the nominated option. This included the following:

- Material prepared in the development of the options by the 5/30 Working Group to describe the options. This included descriptions of the option, its features and the changes from the current NEM arrangements;
- A condensed summary of each option;
- A summary of the key similarities and differences between the options;
- A summary of the key advantages and disadvantages of the options; and,
- The pro-forma from the NRF representatives on the 5/30 Working Group indicating typical impact areas for each option.

In addition, retailers also had access to descriptions of the options on NEMMCO's website and were provided with direct contacts in the 5/30 Working Group who would respond to any queries as they arose. NEMMCO considers that retailers were thoroughly briefed on the nominated option. NEMMCO's validation of the retailer cost estimates also confirmed this view as it involved retailers describing to NEMMCO their understanding of the preferred option and its impact on their processes.

The cost items identified in the survey pro-forma were reviewed by NEMMCO at a high level as part of the process carried out by NEMMCO was to aggregate the confidential costs estimate from each retailer for analysis and reporting purposes. Through this process, NEMMCO gained confidence and understanding in the derivation of each cost item. Some cost items were reviewed by NEMMCO when estimates were received from retailers with some cost items being discussed and subsequently revised. Final cost items were considered by retailers to be non-discretionary due to the requirement for management of 5 minute data streams in their IT systems for the purposes of reconciliation forecasting and billing.

Following validation of retailer costs, NEMMCO considers that retailers have understood the nominated option and its implications for their business.

NEMMCO agrees that it would be inappropriate to include retailer cost items that could be viewed as non-essential to the implementation of the nominated option. Furthermore, NEMMCO agrees with TXU and Hazelwood that a least cost implementation is appropriate, involving only non-discretionary cost items.

The cost validation process carried out by NEMMCO did not find evidence that discretionary costs have been included – or that alternative, cheaper cost implementations could be undertaken to avoid the involvement of expensive retailer CIS systems.

NEMMCO does not consider that the inclusion of discretionary costs has been material to the outcomes of the implementation costs estimates.

### **(d) Retailer costs would have dropped due to recent mergers in the retail sector**

### **Summary of issue**

TransEnergie argue that implementation costs are related to the number of retailers. Further, they consider that because “industry analysts” expect that the number of retailers will reduce over time, the existing number of retailers in the NEM should not influence the costing analysis.

### **NEMMCO response**

NEMMCO agrees that the total retailer sector cost estimates for implementation of the nominated option is related to the number of retailers. NEMMCO, however, considers it to be inappropriate to include industry analyst forward speculations regarding commercial mergers of NEM retailers.

Since the time that the estimation of retailer implementation costs was performed, a number of significant merger/takeovers have occurred in the NEM retail sector. In order to consider this issue further, NEMMCO has reviewed the aggregate retailer implementation cost estimates to account for mergers in the retail sector as at January 2003.

It should be noted that further consideration of this issue from retailers and discussions with NEMMCO during the validation of retailer implementation costs indicate that if, for example, two retailers were to merge into one, then it should not be automatically assumed that the implementation costs (applicable to those retailers) should simply halve. It is more likely that a revised cost of 1.5 times the costs associated with one retailer would be more appropriate as there are always residual areas of business systems that continue separately.

As a lower bound however, and assuming that retailer costs would simply drop by half in the case of a merger, NEMMCO estimates that the implementation costs for the retail sector may have reduced to an NPV of \$98.6M from the original estimate of \$160.2M.

Taking into account the considerations from retailers above, this may more likely lie somewhere in the middle of this range - of the order of \$130M. NEMMCO notes that the range of cost estimates is still a significant cost and would not impact the recommendations of its draft final report.

### **(e) Retailer implementation costs estimates were performed at a time at when significant workload was experienced due to FRC concerns for retailers**

#### **Summary of issue**

TXU discuss in their submission that they expect that retailer implementation cost survey results were biased against further changes following a period of significant IT change to accommodate major full retail contestability (FRC) work. Due to resource constraints, TXU argue that it was difficult to get a realistic and objective assessment of the materiality of the nominated option on retailer systems. TXU consider that this issue has resulted in excessive retailer cost estimates.

#### **NEMMCO response**

The implication from this issue is that due to significant workloads caused by FRC commitments, retailers did not have the capability to adequately invest resources into providing accurate responses to the retailer implementation cost survey.

NEMMCO has followed this issue through with retailers as part of its exercise to validate retailer cost estimates. Retailers dispute TXU’s argument and have asserted that they were in a better position to provide estimates for work scope and cost estimates to accommodate

the nominated option due to their recent design and implementation experience for FRC with their own IT systems.

In analysis between NEMMCO and retailer businesses, including the involvement of systems development staff from both organisations, NEMMCO is satisfied that this issue has not had a material impact on the retailer implementation cost estimates.

### 3.3 Efficiency benefit issues

#### Summary of issue

Submissions from the NGF, Hazelwood Power, Snowy Hydro, Southern Hydro, Hydro Tasmania, TXU and TransEnergie raised concerns in relation to the modelling and more particularly, the analysis or assumptions used by the economic consultant (MMA) in examining the efficiency benefits from the nominated option.

Issues of concern encompassed the following areas:

- Concern with the use of a forward looking chronological simulation technique rather than a historical analysis technique;
- The appropriateness of assumptions used in the modelling;
- Underestimating the dynamic efficiency benefits<sup>11</sup>;
- A failure to properly account for areas where efficiency benefits may be derived, such as;
  - Benefits to the financial markets;
  - The impact to Settlements Residue Auction (SRA) unit holders;
- Concern that the modelling appeared to demonstrate a low level of price volatility relative to the volatility historically seen in the NEM; and,
- Not specifically including the complete scope of major potential events in the market such as those that have been seen in recent years including significant industrial action or other major plant problems.

In order to respond to issues raised in submissions regarding the economic modelling and evaluation work, NEMMCO engaged MMA to provide additional economic advice as well as to perform further analysis work on the previous simulation data results to identify financial transfer payments. The results from this additional work are discussed in the following sections.

MMA has responded to the issues raised in submissions specifically regarding their analysis work on the project in an MMA report <sup>12</sup> dated 11 February 2003 to NEMMCO. That report is referred to as “*MMA’s Reply to Submission Issues*” in subsequent sections of this report.

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<sup>11</sup> An explanation of market efficiency benefits is provided in Appendix 1. This included the distinction between dynamic, allocative and productive efficiency benefits.

<sup>12</sup> MMA’s report titled “*Reply to Comments on the Benefit/Cost Study of the 5/30 Anomaly*” 11 February 2003 is available on NEMMCO’s website at the following

The specific areas of concern raised in participant submissions are considered in more detail below.

### 3.3.1 Forward looking simulation model methodology

#### Summary of Issue

Submissions from TXU, NGF, Southern Hydro, Hydro Tasmania and Snowy were concerned with the fundamental modelling approach adopted by MMA in undertaking their analysis. They argue that an historical analysis technique would be more appropriate than a forward looking model such as that used by MMA in their analysis because MMA's simulation model underestimates the benefits of the options to address the 5/30 issue.

#### NEMMCO response

MMA utilised a chronological simulation methodology (monte-carlo simulation) with a forward modelling period of ten years. MMA considered in detail the concerns raised in submissions relating to this modelling and addressed this issue in '*MMA's Reply to Submission Issues*'. MMA considers that both ex-ante and ex-post modelling techniques can be used to examine efficiency benefits, with each having its own advantages and disadvantages.

An ex-ante modelling approach was specifically used for this project by MMA as it was considered by MMA to be superior for the following reasons:

- A large market data set, free from external influences, would have been required for ex-post analysis. This is not available in the NEM environment;
- Dynamic efficiency benefits are difficult to measure from historical analysis; and,
- The likelihood of recurrence of significant market events from historical data would need to be addressed.

In addition, a critical issue identified by the working group in the analysis of the 5/30 issue was that changes to generator behaviour in the market would occur if the 5/30 issue were to be resolved by implementation of the nominated option. MMA consider that the forward modelling approach was the most appropriate way for these behavioural issues to be modelled in the analysis.

NEMMCO is satisfied that a forward modelling approach was a suitable technique for examining the 5/30 issue, and most appropriately, it enabled a range of contingent market states<sup>13</sup> to be modelled rather than just the one contingent state provided by historical analysis. It is also the only appropriate form that would capture varied behaviour by generators in bidding strategies under different settlement regimes.

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URL: [www.nemmco.com.au/future/design/1182.htm](http://www.nemmco.com.au/future/design/1182.htm)

<sup>13</sup> A contingent market state represents one possible outcome of market events for a dispatch interval. A scenario is made up of studies representing a complete set of all potential outcomes. This accounts for the likelihood of generator forced outages, interregional constraints, new plant investment, transmission augmentations and regional demands as well as many external factors. As such, an historical market dispatch interval represents just one such contingent state. When modelling into the future, modelling techniques should consider the range and probability of all contingent market states when predicting the spectrum of possible market outcomes.

Some market participants have been noted to argue against a forward modelling approach in NEMMCO's submission on the 5/30 issue and for the forward modelling approach on other issues.<sup>14</sup>

Modelling data and assumptions used by MMA were queried by some submissions. Concerns included the reserve levels assumed in the modelling differing from NEMMCO forecasts contained in the SOO<sup>15</sup> as well as the timing of new plant and the apparent assumption of "just in time" plant investment.

MMA has confirmed that SOO data was utilised as the modelling base data and points out that the inevitable uncertainty of modelling assumptions has been recognised and specifically dealt with through the adoption of modelling scenarios chosen to cover a range of possible market outcomes (and modelling assumption inaccuracy). MMA has provided a summary of its reserve level assumptions in section 2.2.1 of its final report<sup>16</sup>.

Four scenarios were modelled by MMA, including a medium (most likely) scenario, a "no Basslink" scenario, a "cycling" scenario and a high load growth scenario. These scenarios were performed to test the robustness of the modelling outcomes to either modelling inaccuracies or known contingent events such as the timing of the Basslink project.

Southern Hydro was concerned that a "just in time" investment modelling assumption was inappropriate and that such an assumption implies that the investment structure has a perfect view of future returns. MMA has considered this issue through examination of prior investments in the NEM and has noted that both pre-emptive and delayed plant investments have occurred to date. The sensitivity scenario performed for "cycling" periods of supply and demand balance addresses this issue. This sensitivity scenario examined the delay in entry of the next tranche of new supply capacity and resulted in varied benefits that were considered in the analysis.

NEMMCO has now considered the issues raised by respondents, and MMA's response in these areas. NEMMCO has not found cause to disagree with the modelling assumptions and believes that they are consistent with the MMA discussions held with the working group prior to the modelling.

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<sup>14</sup> Submissions to the ACCC's consultation: "VENCorp application for re-authorisation of the MSOR" – September 2002

<sup>15</sup> The SOO is an annual NEMMCO publication containing a forecast of the supply and demand balance in the NEM. Further information regarding the SOO may be found on the NEMMCO website.

<sup>16</sup> MMA report titled "*Benefits and Costs of Alternative Arrangements for Aligning Dispatch Prices and Settlement Payouts*", 22 May 2002 and is available on NEMMCO's website at the following URL: [www.nemmco.com.au/future/design/1182.htm](http://www.nemmco.com.au/future/design/1182.htm)

### 3.3.3 Dynamic Efficiency Benefits

#### Summary of Issue

A major observation in most dissenting submissions was that little or no dynamic efficiency benefits arose from the modelling. It was claimed that this outcome is counter-intuitive. Submissions from TXU and Southern Hydro in particular expressed disbelief that negligible benefits were identified in modelling from addressing the 5/30 issue. It was argued that the expected types of plant invested in the NEM would be expected to differ somewhat with and without the 5/30 issue being present. TXU suggests that the model will forecast a heavy investment in base load plant and that the 5/30 issue deters the entry of peaking plant to the market.

#### NEMMCO response

MMA modelling showed that resolving the 5/30 issue did not materially impact the plant investment mix in the NEM from the “no change scenario” over the ten year study period. This was due to a number of assumptions regarding committed projects, and that the entry of plant is impacted by a range of market factors and is not solely dependant the incidence of price spikes in the NEM. Price spikes and modelled volatility are discussed below.

It is key to note that the model optimised the investment of new plant by ensuring that new plants had their entry delayed until their operation was profitable over a 1 year period. The modelling results indicated that the types of plant selected by the simulation were principally intermediate and peaking plant (rather than base load plant) – even under the existing NEM settlement arrangements.

MMA explain that their results are also confirmed by the recent entry of about 1000MW of new peaking capacity to the NEM. While acknowledging that changed settlement arrangements may assist peaking plant, the considerations noted here would indicate that the current settlement arrangements do not in themselves deter the entry of peaking plant as stipulated in submissions.

### 3.3.4 Price Volatility and Significant Market Events

#### Summary of Issue

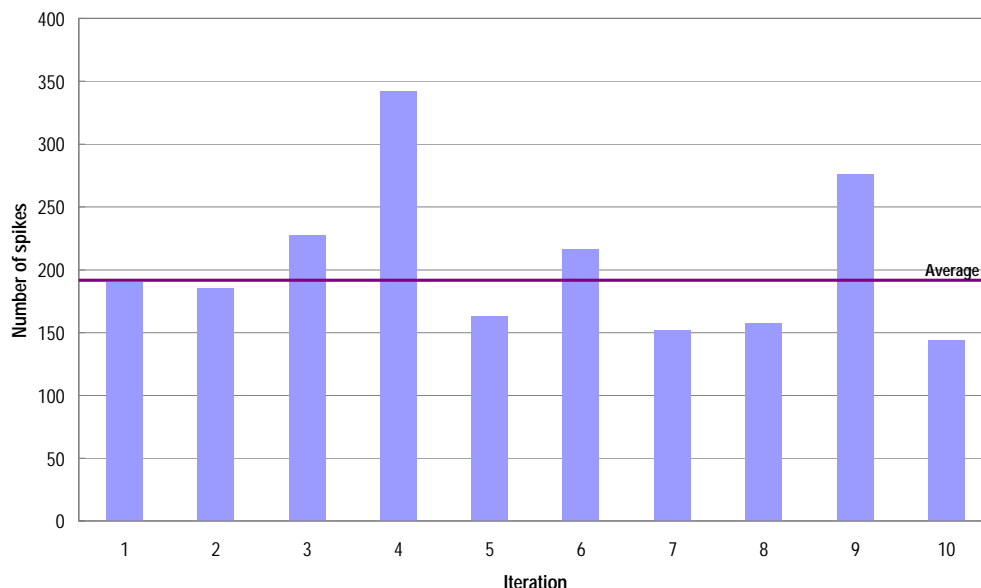
Modelled price volatility by MMA was questioned by TXU and Southern Hydro. They argue that the volatility implied in the modelling results is significantly lower than that seen in historical NEM data. They also note that a common sense check whereby a calibration of the modelling results against historical data had not been undertaken by MMA.

#### NEMMCO response

MMA explain in section 2.1.1 of their report *MMA's Reply to Submission Issues* that the modelling methodology results in estimates of price levels in each trading interval in a number of simulated contingent states of the market. Actual history may well differ from the modelled price estimates as it represents just one contingent state of the market. MMA modelling examines many contingent market states. As such, the analysis of historical data does not consider the broad range of possible market outcomes.

This is to be expected, particularly if some significant market events were to have occurred during the period of history being reviewed. These may not be exactly representative of the events that would occur into the future. It should be noted that the forward simulation methodology delivers results for the average impact of outcomes over the forward modelled

period. Consequently, comparison against specific historical events (rather than average impacts) is not appropriate. The following graph from *MMA's Reply to Submission Issues* illustrates the incidence of price spikes greater than \$100/MWh in a number of simulation iterations. Each iteration shown represents one contingent state of the market. The average number of price spikes is also shown.



**Figure 1 No. of dispatch intervals in Victoria greater than \$100/MWh**

The modelling results depend on the probabilistic outcomes of other influences such as generator outages and weather induced demand affects. Hence the MMA modelling indicates the average of a number of potential price outcomes in a trading interval. *“The actual price and the number of price spikes will be higher or lower than expected, depending on actual outcomes (generator availability / demand) in the market”.*

A calibration against historical data has been performed by MMA. Section 3.3 (Table 3.3) of their report<sup>17</sup> presents the results of this calibration. TXU argued that the calibration performed was not correct in that it used actual market data and bids and simply proved the model's dispatch engine. This is not correct. The calibration performed utilised an optimised set of generator bids (generic to any time period) and simulated the 2001 calendar year using actual NEM demands. This performed a calibration of the model's ability to predict price spikes with the difference between actual and modelled spikes less than 3% for the NEM as a whole.

NEMMCO has considered issues raised in the consultation regarding price volatility modelling and MMA's response and is satisfied with the previous results and interpretation of the modelling. MMA do note that an alternate methodology could have been used involving a distribution of prices to gauge the probability that the benefits would exceed the costs. It was considered by MMA as unlikely that this approach would change the conclusion drawn from the modelling as the benefits on average were still unlikely to exceed costs. In addition, any impact from either industrial action or system operating errors were not accounted for in the modelling as these issues were not considered predictable in terms of timing or the nature of their impact.

<sup>17</sup> MMA report titled *“Benefits and Costs of Alternative Arrangements for Aligning Dispatch Prices and Settlement Payouts”*, 22 May 2002 is available on NEMMCO's website at the following URL: [www.nemmco.com.au/future/design/1182.htm](http://www.nemmco.com.au/future/design/1182.htm)





### 3.3.5 Exclusion of Benefits to Financial Markets

#### Summary of Issue

Financial markets are essential in managing risks for NEM participants. Submissions from dissenting parties indicate that the evaluation of efficiency benefits to the market via the financial markets had been either ignored or underestimated in the analysis.

#### NEMMCO response

MMA have identified two impacts upon the financial markets from resolving the 5/30 issue, namely;

- Generators face risks in physically backing financial contracts with a 30 minute calculation period; and,
- There is a reduced incentive to provide one-way contracts which reduces liquidity in the financial markets.

These have been included in the analysis by accounting for the ability to increase bid prices to reflect the additional costs incurred by the 5/30 issue and defending financial markets contracts and secondly, by modelling generator rebidding behaviour.

Generator rebidding behaviour changes were modelled following discussions with generators regarding how they may act under different settlement regimes. These discussions delivered an understanding to NEMMCO and MMA that a shift in generator bidding behaviour would occur if the 5/30 issue were to be resolved. Under current NEM dispatch and settlement arrangements generators are likely to rebid within the trading interval to defend financial contracts. Such a generator behavioural change would involve a generator no longer rebidding capacity into low price bands to ensure dispatch in dispatch periods within a trading interval following a dispatch price spike. That is to say that under current arrangements, generating plant is price responsive to not just the spot prices in dispatch intervals per se – but more so, to the impact of dispatch price spikes on the generator's contracted position for the 30 minute trading interval.

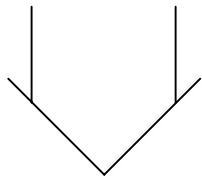
The analysis of MMA's modelling resulted in identification of productive efficiency losses arising from the additional fuel costs from dispatching gas plant instead of cheaper marginal cost plant or from the opportunity cost of water in hydro electric plant in low price periods. (i.e. Water, being a scarce resource with a given energy availability modelled across a year, is used less efficiently if it is dumped during low dispatch price dispatch intervals by a hydro generator when trying to maximise energy production in a trading interval as it defends financial markets contracts). NEMMCO agrees that MMA modelling has shown that the 5/30 issues represents a material market inefficiency which has now been quantified.

MMA also note the following :

*"In a competitive market, the additional premium on one way contracts under current settlement arrangements should be equivalent to the additional cost of continuing generation in periods beyond the price spike"*

This impact has been accounted for in the analysis as a productive efficiency cost. NEMMCO agrees with this view as well as MMA's position that double accounting would occur if the increase in premiums were separately added in the evaluation of efficiency benefits.

If the 5/30 issue were to be resolved via the nominated option, a reduction should occur in the risk premiums associated with financial markets contracts to some market customers. This should lower the cost of energy to those market customers. MMA argues that this reduction in price to market customers from financial contracts would be offset by equivalent higher prices in the post spike dispatch prices and concludes that the direction and magnitude of the transfer to consumers from changes in prices is difficult to determine a priori. That is to say that Market Customers may benefit by lower risk premiums in the financial markets but that these will be offset by the imposition of the settlements levy under the nominated option. NEMMCO agrees with this position and considers that the net effect to end consumers is likely to be minimal as described below.

<b>Impact Area</b>	<b>Current NEM arrangements (with 5/30 issue)</b>	<b>Resolved 5/30 Issue (Nominated Option)</b>
<b>Spot Purchases</b>	Current spot prices	Higher prices in post spike dispatch intervals
<b>Risk premium payments on financial contracts</b>	Included	Lower risk premiums
<b>Levy on Market Customers under nominated option</b>	No Levy	Levy increases cost of energy   Offset leads to
<b>Net Impact</b>		Small net change

**Table 1: Net impact on Market Customer when considering financial markets contracts and levy under nominated option**

Note: Savings achieved by Market Customers by lower risk premiums charged on financial markets hedge contracts would be negated by the settlements levy introduced by the nominated option.

**3.3.6 Exclusion of Benefits to SRA Unit Holders**

**Summary of Issue**

TXU's submission gave an example of the impact of the 5/30 issue on SRA unit holders noting that SRA unit holders are unable to respond to the risk by rebidding.

**NEMMCO response**

As explored in *MMA's Reply to Submission Issues*, MMA argue that the impact of the 5/30 issue on SRA units was not included in their analysis as the flows across regulated interconnectors are not affected directly by the prospect of negative income streams.

Resolving the 5/30 issue will therefore not impact on the behaviour of interconnector flows, except in so far as dispatch patterns may alter within regions. This latter effect has already been captured in the simulation modelling and initial analysis and report. In addition, any change in the incidence of negative income flows would represent a transfer payment between parties rather than an efficiency gain to the market.

NEMMCO has considered this issue and is satisfied with MMA's response.

### 3.4 Terms of reference

#### Summary of issue

Submissions from TXU, Hydro Tasmania, Snowy Hydro and Southern Hydro argued that the scope of the evaluation, being restricted to market efficiency issues, is too narrow. They consider that a broader range of evaluation criteria should be used in the review. This would have the effect of capturing other areas of non-efficiency related benefits in addressing the 5/30 issue such as financial transfer payments and impacts from the financial markets.

Incitec also note that the impact of the final costs of changes to market arrangements on end users have not been directly accounted for in the analysis.

#### NEMMCO response

This work stream was undertaken by NEMMCO in accordance with its market objective to improve market efficiency.

Consistent with this objective, NEMMCO would propose or recommend code changes to address the 5/30 issue if it were demonstrated that a net benefit in terms of market efficiency would be delivered by moving to alternate market arrangements. Further information regarding the economic definition of market efficiency is contained in Appendix 1. Note also that NEMMCO has subsequently developed and published an Efficiency Assessment Framework to guide and support analyses such as the 5/30 investigation<sup>18</sup>.

NEMMCO is therefore not in a position in this case to use a broader set of evaluation criteria. This does not however, preclude stakeholders themselves from pursuing this issue with parties that are in a position to apply a broader assessment criteria.

The changes in total costs of electricity for end users relative to other market sectors represents a financial transfer payment. Like other transfer payments, these represent a change of wealth (in economic terms) between parties, however, they do not constitute a change to market efficiency. If the total or final cost of electricity changes to say retailers, from whom the majority of end users purchase their electricity, then the modelling performed by MMA will capture this effect if a market efficiency issue is involved.

It should also be noted that following supplementary analysis work performed by MMA for NEMMCO regarding the quantification of financial transfer payments (detailed in MMA's report<sup>19</sup>), it would appear that even a broader evaluation criteria that included the consideration of financial transfer payments may not be sufficient to show that a net market benefit would result from a resolution of the 5/30 issue with some certainty. Unless varied in the Code, changes to the NEM that seek primarily to implement wealth transfers, or to significantly alter current wealth distributions, are a matter for Governments to consider. NEMMCO remains of the view that it would need to see a net market efficiency benefit before promoting this change.

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<sup>18</sup> NEMMCO's report titled "*Assessing the efficiency impact of proposed changes to market arrangements – Guideline*", 27 August 2002 is available on NEMMCO's website at the following URL: <http://www.nemmco.com.au/future/design/108-0016.htm>

<sup>19</sup> MMA Report: "*Financial Transfer Payments for the Base Scenario Modelled for the 5/30 Project*", 7 August 2002.

### 3.5 Other issues

#### 3.5.1 Transfer Payments

##### Summary Of Issue

The issue of how transfer payments have been treated in the cost / benefit analysis drew the attention of a number of parties in their submissions. Snowy Hydro and TXU believe that transfer payments, which are effectively a transfer of wealth from one party to another as a consequence of a changed settlement arrangement in the context of the 5/30 issue, should be included in the analysis. TransEnergie on the other hand, believe that transfer payments should be excluded from the analysis when market efficiency is being evaluated.

##### NEMMCO response

NEMMCO has undertaken the review of the 5/30 issue in accordance with its Code objective regarding market efficiency as discussed previously.

Financial transfer payments arise from monies being redistributed between various parties in the market but do not necessarily represent an increase or decrease in market efficiency. As such MMA have not included transfer payments in evaluating the market efficiency benefits of the nominated option. NEMMCO is satisfied with this position.

It should be noted, however, that NEMMCO have requested MMA to extract from their existing modelling output data the total transfer payments involved in each year of the 10 year modelling period. This data provides an indication of the materiality of transfer payments in resolving the 5/30 issue and is contained in section 3 of their report "*Financial Transfer Payments for the Base Scenario Modelled for the 5/30 Project*" and reproduced below.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
NSW	4.6	1.8	0.7	3.8	0.6	0.9	2.8	6.2	3.3	4.1
SA	1.4	1.2	1.7	1.1	0.6	1.2	1.1	2.1	1.4	1.5
VIC	3.2	0.6	0.5	1.9	3.8	0.7	1.9	2.7	1.7	2.1
Queensland	2.4	1.0	0.5	2.7	4.0	1.5	1.8	4.1	2.5	2.8
<b>Total</b>	11.6	4.6	3.4	9.5	9.0	4.3	7.5	15.0	8.9	10.5

**Table 2: Transfer Payment (\$M) assuming 15% of market customers (by volume) opt in for the simulated 5 minute settlement.**

The size of the transfer payments is a function of the proportion of market customers 'opting in' to the 5 minute simulated settlement regime. MMA estimate a reasonable number to be 15% of market customers (by volume). The NPV of the settlement surplus in this case is \$55M over the ten year modelling period. As an additional comparison, the transfer payments attributable to a much higher opt in rate of 30% of market customers (by volume) has also been presented by MMA but not reproduced here. It showed that the NPV of the settlement surplus would be double that of the 15% opt in case.

It should be noted that the estimated transfer payments arising from the 5/30 issue represent a small proportion of the energy market value and indeed a small proportion of the cited implementation costs to implement the nominated option.

Finally, Snowy argued that NEMMCO should escalate the issue of transfer payments (wealth transfers) to another forum in accordance with the NEMMCO market efficiency guidelines where a broader set of evaluation criteria may be considered. NEMMCO concludes from MMA's analysis that even if the likely transfer payments were to have been included in the analysis, a clear net benefit would still not be indicated. NEMMCO accepts that it would formally advise these issues to NEM jurisdictions if a change was to be pursued, however this is not the case, and consequently an escalation of the wealth reallocation changes to another forum is not warranted.

### **3.5.2 Focus For MMA Work**

#### **Summary of Issue**

TransEnergie indicated that the consultant appeared to not make an equal effort to quantify the benefits as they did for the costs.

#### **NEMMCO response**

This is not the case as MMA were engaged by NEMMCO to evaluate the efficiency benefits of the options to address the 5/30 issue. MMA did not evaluate the implementation costs for the nominated option as this function was instead performed by the members of the 5/30 Working Group for their respective industry sectors.

### **3.5.3 ACCC concerns**

#### **Summary of Issue**

Southern Hydro note in their submission that the ACCC highlighted the 5/30 issue "as one deserving considerable work to resolve some of the issues that it sees arising from bidding and re-bidding practices" in its rebidding draft determination<sup>20</sup>. Southern Hydro do not consider that NEMMCO's draft final report properly addresses the ACCC's concerns regarding bidding and rebidding practices.

#### **NEMMCO response**

NEMMCO discussed this matter with the ACCC and understands that the 5/30 issue was noted in the ACCC rebidding draft determination as one potential area for addressing market power in the NEM if settlement arrangements were altered to those of the nominated option as a result of NEMMCO's review.

The ACCC confirmed that no specific implication was intended to be inferred in the document regarding the scope of NEMMCO's terms of reference, the execution, or the outcome of the review of the 5/30 issue.

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<sup>20</sup> ACCC Rebidding Draft Determination, 3 July 2002. URL: <http://www.accc.gov.au/electric/fs-elec.htm>

### 3.6 Consideration of other options

#### Summary of issue

TXU recommended in their submission that NEMMCO further consider other options raised in the working group process to address the 5/30 issue if the nominated option failed to pass a benefit/cost analysis.

#### NEMMCO response

The 5/30 Working Group assisted NEMMCO to identify various options to address the 5/30 issue. The nominated option was put forward for further detailed evaluation as it was viewed as being superior to other options identified. NEMMCO considers that further investigation into other options previously identified by the working group is not warranted.

One option, however, the “30 minute dispatch and 30 minute settlement “, was not considered for further evaluation in the working group process to address the 5/30 issue in isolation as it had wide ranging structural implications for the design of the NEM and could only be considered in a broader review of the NEM design.

NEMMCO would require input from a broad spectrum of stakeholders in a more general review of NEM arrangements to review this option further due to its broad market implications.



## Conclusion

NEMMCO's draft final report into the 5/30 issue elicited a number of submissions from interested parties which raised issues regarding the estimated implementation costs, and the evaluation of market efficiency benefits by MMA as well as other issues.

NEMMCO has reviewed 13 submissions and has considered in detail all issues raised in these submissions. NEMMCO's response is detailed in this report.

In considering the issues made in submissions, NEMMCO has confirmed the scope of the analysis and the appropriateness of its terms of reference. NEMMCO also sought additional advice from MMA in order to respond to issues regarding the economic modelling and evaluation of the market efficiency benefits applicable to the nominated option.

Other issues raised in submissions and not accounted for in NEMMCO's draft final report such as the size of the estimated settlement levy under the nominated option have been quantified through subsequent analysis by MMA.

A review of the conclusions presented in NEMMCO's draft final report (in italics) following consideration of all submission issues is presented below.

### (a) Benefit / Costs Analysis:

*"The net benefits to the market of the nominated was found to be substantially negative and therefore did not support NEMMCO initiating a proposal to change the NEM arrangements to address the 5/30 issue."*

NEMMCO acknowledges that the 5/30 issue represents a market inefficiency which has been quantified in this review. The implementation costs to resolve the issue however, have been shown to outweigh the market efficiency benefits.

Submissions critically focussed on many aspects of the benefit/cost analysis upon which this conclusion draws, as discussed in previous sections. In considering these issues, NEMMCO undertook validation of retailer implementation costs as well as obtaining additional information from MMA regarding their evaluation of market efficiency benefits.

This review indicated that whilst there will always remain some uncertainty in the accuracy of modelling market arrangements into the future, these can be managed by sensitivity studies such as those carried out by MMA. There were also some inaccuracies identified in the estimation of implementation costs. Consideration of issues regarding both the costs and benefit evaluations has not altered the outcome from the draft report that implementation costs exceed the efficiency benefits.

NEMMCO is satisfied that the evaluation of both costs and benefits is reasonable.

Economic guidance from MMA indicates that market efficiency benefits should outweigh the implementation costs by a considerable margin before changes to NEM arrangements should be proposed. This has been shown to not be the case for the 5/30 issue.

NEMMCO's conclusion regarding the benefit/cost analysis therefore remains unchanged following consideration of all submission issues.

**(b) Alternative Option:**

*“Option 2.2 was considered undesirable for a range of reasons including its potential impact on the financial markets. This option should be discarded.”*

Market participants did not dispute this NEMMCO conclusion in their submissions.

**(c) Financial Market Impacts:**

*“Some unquantifiable benefits may be delivered by the options in the area of financial markets. In particular, option 1.1(b) may result in better financial instruments being developed and that this may increase financial markets liquidity.”*

Further consideration of the impact of the nominated option on financial markets by MMA has indicated that some benefit may be received by market customers in reduced hedge premiums, however these gains should be offset by an equivalent payment by market customers under the levy imposed by the preferred option.

The above conclusion by NEMMCO regarding the impact on financial markets remains unchanged following consideration of all submission issues.

**(d) Impact of Financial Transfer Payments:**

*“On the basis of the analysis performed in this project, a proportion of the impact arising from the 5/30 issue and its resolution lie in the allocation of financial transfer payments<sup>21</sup> rather than in efficiency impacts. NEMMCO does not consider it is in a position to promote change on those grounds alone. This impact maybe significant to the stakeholders concerned”*

NEMMCO has confirmed that transfer payments do not constitute changes to market efficiency and should not be included in its assessment criteria. Stakeholders may wish to pursue changes with parties that are in a position to apply broader criteria to the assessment than NEMMCO.

NEMMCO obtained quantification of these transfer payments<sup>22</sup> from MMA. This information indicated that a cost/benefit analysis may not show a net benefit even if transfer payments were to be included in a broader assessment criteria.

Following consideration of all submission issues, the above conclusion by NEMMCO regarding the transfer payments remains unchanged.

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<sup>21</sup> Distribution payments (or transfer payments) as described by MMA in their final report: *“Benefits and Costs of Alternative Arrangements for Aligning Dispatch Prices and Settlement Payouts”*, 22 May 2002..

<sup>22</sup> MMA report *“Financial Transfer Payments for the Base Scenario Modelled for the 5/30 Project”*, 7 August 2002.

## Glossary and abbreviations

Term	Definition
ACCC	The Australian Competition and Consumer Commission
CIS	Customer Information System. These systems are used by retailers to manage mass market business processes such as settlement and billing.
Code , The Code	The National Electricity Code
Contingent market state	One complete set of attributes that represent a potential market outcome for a dispatch interval. This includes for example a particular combination of generating units, regional demands, transmission system configuration, regulatory arrangements etc.
Generator	A defined code term: “A person who engages in the activity of owning, controlling, or operating a <i>generating system</i> that supplies electricity to, or who otherwise <i>supplies</i> electricity to, a <i>transmission or distribution system</i> and who is registered with <i>NEMMCO</i> in that capacity, as described in Chapter 2 of the Code”
Helpdesk	The NEMMCO Infoline is a staffed information centre to provide NEMMCO assistance on NEM related issues. Infoline also administers the NEMMCO Website. Phone contact: +61 1300 361 011
Market Customer	A defined code term: “A <i>Customer</i> who has classified any of its <i>loads</i> as a market load and who is also registered with <i>NEMMCO</i> as a <i>Market Customer</i> under Chapter 2 of the Code”
Market Efficiency	An economic term described in Appendix 1.
MMA	McLennan Magasanik Associates. A consulting firm offering modelling and economic expertise.
MMS	Market Management Systems. The IT systems used by NEMMCO to manage the <i>market</i> .
NECA	National Electricity Code Administrator Limited A.C.N. 073 942 775, the company responsible for administering the Code.

<b>Term</b>	<b>Definition</b>
NEM	The National Electricity Market
NEMMCO	National Electricity Market Management Company Limited A.C.N. 072 010 327, the company which operates and administers the market in accordance with the Code.

## APPENDIX 1: Market Efficiency

### Defining Efficiency

NEMMCO engaged McLennan Magasanik Associates (MMA) to perform economic analysis and quantitative modelling for the 5/30 issue.

Before commencing any detailed modelling work, MMA produced an Issues Paper<sup>23</sup> which discussed the economic notion of market efficiency from a practical perspective, as well as their proposed methodology to quantify efficiency gains. This issues paper was discussed with the working group and refined as a first step. Following consolidation of their issues paper, MMA proceeded to carry out modelling work over a number of months, leading to the production of a final report which presents their findings.

Three types of efficiency gains are described by MMA in its issues paper and final report, with the description of the efficiency gains expressed by MMA as follows:

**Productive efficiency:** *Productive efficiency occurs when the least cost combination of inputs is being used to produce a given level of output. In the wholesale electricity market, it implies that the least cost plants are being dispatched to supply demand. Critics of current settlement arrangements argue that they result in inefficient dispatch of plant either through high cost plant being dispatched ahead of other plant in the post spike dispatch intervals or hydro-electric generation not being used optimally.*

**Allocative efficiency:** *Allocative inefficiency occurs where prices do not equal marginal costs because of the exercise of market power or through the price setting process. By discouraging the dispatch of some fast ramp plant or demand side management (DSM) from the market, the current settlement arrangements may prevent allocative efficiency. Greater commitment of either option may increase the intensity of competition in the market for fast ramping plant.*

**Dynamic efficiency:** *Where the least cost options for electricity supply are encouraged to enter the market over time. In respect of the 5/30 issue, concern has been raised that the current NEM arrangements may result in inadequate returns to encourage entry of fast ramping options, resulting in new entrant generation of a type that is not optimal. By resolving the 5/30 issue, other fast ramp options may be better encouraged to enter the market - including fast ramp peaking plant; new dispatchable loads; and enhancements to the ramp rates of existing plant.*

It should be noted that options to address the 5/30 issue would result in wealth transfers from some NEM participants to others when changes are proposed to dispatch and settlements regimes (for example transfers may occur from customers to peaking generators). These wealth transfers do not necessarily represent market efficiency gains and have been considered by MMA on a case by case basis. Wealth transfers that do not represent efficiency gains to the market are not used by NEMMCO to support changes to the NEM arrangements but are generally issues for NEM jurisdictions to consider. The issue of transfers and identifying market efficiency gains are explained in greater detail in section 3 of MMA's Final Report.

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<sup>23</sup> "Issues Paper: Modelling of the Efficiency Gains from Resolution of 5/30 Issue", McLennan Magasanik Associates, 28 January 2002.