

**Report to Commerce Commission
on the
Draft Determination
on the Arrangement Proposed
by the
Electricity Governance Board Limited**

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1 Executive Summary

1.1 Introduction

1. In its Draft Determination published on Friday 26 April 2002, the Commission reached a preliminary view that it was not satisfied that the public benefits of the proposed arrangement would outweigh the detriments. In particular, the Commission assessed that the range of possible detriments overlaps with the range for possible benefits, ie. net benefits could be positive or negative (see Table 1).
2. In arriving at its assessment, the Commission focused its quantitative analysis on two aspects of the proposed arrangement that it believed would give rise to substantive detriments relative to the counterfactual:
 - *Strike down of pro-competitive rule changes*: The risk that vertically-integrated generator/retailers would have an incentive to use their voting power to strike down pro-competitive rule changes (an assessed detriment of \$33m-\$72m NPV); and
 - *Transmission under-investment*: The risk that lines companies would be allocated a large share of votes in circumstances where they have no incentive to vote for transmission investments (an assessed detriment of \$29-\$54 million NPV).
3. The Commission also considered that:
 - 'Guiding Principles'; and
 - 'comprehensive coverage'

were two further areas where detriments potentially could arise. However, the Commission did not assign estimates in these areas.

1.2 Scope of this report

4. We have been commissioned by the Applicant to provide further economic analysis of the proposed arrangements. This report provides comment on the key areas of concern identified by the Commission and listed above.
5. In addition, we comment on the Commission's assessment that competitiveness in the transmission market would be similar under the proposed arrangement and the counterfactual. Two technical issues are also raised regarding the cost of capital and calculation of dynamic efficiency.

1.3 Summary of our conclusions

6. Our overall conclusion in this report is that a detailed examination of the issues in each of the four areas identified by the Commission suggests the proposed arrangement would be either neutral or confer a positive benefit relative to the counterfactual. In particular:
 - We consider that the Commission’s assessment relating to under-investment in transmission is premised on an incomplete understanding of the proposed transmission investment rules; and
 - In the area of pro-competitive rule changes, we present a detailed study of NZEM that finds no evidence of generator/retailers blocking pro-competitive rule changes.
7. Based on the qualitative and quantitative analysis presented in this report, we assess the proposed arrangement would confer no detriment relative to the counterfactual. We also assess that the benefits under the proposed arrangement are considerably higher than estimated in the Draft Determination (see Table 1).

Table 1: Summary of net public benefit

Quantitative	Draft Determination	New assessment
Total public benefits (NPV, \$m)	59 - 118	152 - 310
Total public detriments (NPV, \$m)	62 - 127	zero
Qualitative		
Guiding Principles	Potentially -ve	+ve
Comprehensive coverage	-ve	Neutral

1.4 Summary of the main issues and our responses section by section.

Guiding Principles

8. The Commission considers that to the extent that the Guiding Principles vary from the GPS, there is some potential for the proposed arrangements to lessen competition, or otherwise harm consumer welfare, compared with the counterfactual.
9. In addition to arguing that the Guiding Principles are consistent with the GPS, we suggest that the relevant question for public analysis is whether the Guiding Principles are superior or inferior to the GPS in performing their intended role. In this regard, we note that the guiding principles section of the GPS is not well expressed in terms that are recognisable as principles that could be inserted into a legally binding contract such as the proposed arrangement.

10. The Guiding Principles are expected to perform their intended role better than the GPS because the former are likely to be more enduring, have less potential for conflicts, and possess higher discriminatory power than the GPS.
11. An additional important point is that the Guiding Principles, by retaining much of the language from the existing codes (ie., MARIA, MACQS and NZEM), are likely to reduce transaction costs relative to the GPS. The Guiding Principles have the advantage of retaining as much as possible of the six years of precedent and understanding developed on the basis of the existing codes.

Pro-competitive rule changes

12. The Commission considers that vertically integrated generator-retailer companies may have incentives to block or delay rule changes that would have the effect of lowering barriers to entry, or enabling greater competitive discipline.
13. We review these concerns and conclude that the proposed industry arrangement reduces the likelihood of pro-competitive rule changes being blocked, for the following reasons:
 - Firstly, no single industry participant can veto a rule change. The different production processes of the generators and their varied locations on the grid make it difficult to conceive of an efficiency enhancing rule change that would simultaneously disadvantage a majority of existing companies. The counterfactual contains the risk that concentrated interests may persuade the single decision-maker.
 - Secondly, the proposed arrangements contain a carefully designed decision-process that is open and transparent and intended to ensure that all proposals are considered on their merits. The counterfactual encourages lobbying, rather than participation in technical working groups.
 - Thirdly, any rule change that would improve competition would release value. The clearer definition of decision-rights under the industry process should facilitate bargains between parties that would gain from a change and those that would lose. That is, the arrangements facilitate changes which economist call Pareto Optimal – changes that make at least one party better off without making any party worse off. The counterfactual would allow rule changes to proceed that made one entity better off at the cost to all other parties.
 - Fourthly, the Government may declare the objectives for the industry EGB, will negotiate performance standards with the EGB annually under Part XV of the Electricity Act, and two officers of Parliament report annually on progress against those objectives and standards. This provides a mechanism for the Government to apply continued pressure should concern emerge that specific pro-competitive rules changes were being delayed or blocked.
 - Fifthly, there are inherent incentives on the transmission provider and system operator to over emphasize system security at the expense of competition. The industry arrangements provide countervailing tensions,

whereas this competitive risk is exacerbated under the counterfactual.

14. Evidence from NZEM voting records supports this qualitative analysis, in that:
 - No pro-competitive rule changes put to the vote in NZEM have been voted down.
 - The duration for pro-competitive rule changes to be processed is no longer on average, and may be shorter, than neutral rule changes.

Transmission under-investment

15. The Commission considers that the proposed arrangement could result in significant under-investment in transmission services relative to the counterfactual.
16. We provide a detailed discussion of the proposed arrangement relating to transmission services to clarify several apparent misunderstandings identified in the Draft Determination, and to establish a framework for comparing the proposed arrangement with the counterfactual. The analysis suggests that the counterfactual would be likely to bear higher transaction costs in making investment decisions.
17. Additionally, the use of regulatory force under the counterfactual to mandate transmission investments would likely have adverse impacts on other industry participants. In particular, there is significant risk of crowding out through under-investment by competitor and substitute suppliers to Transpower.

Competitiveness of the transmission market

18. The Commission considers that pressures to achieve operational efficiency gains would be greater under the proposed arrangement than the status quo, but appears to consider that the majority of these gains would be also achieved under the counterfactual.
19. Our review draws in large measure on the previous section, where we reason that mandated investment would crowd out private competitors. We consider that under the counterfactual the Crown EGB would become increasingly involved in decisions on transmission investment and would inevitably become reliant on expert advice with a strong bias toward transmission solutions, at the expense of substitute services. Hence, the counterfactual would tend to result in reduced rivalry and competitive pressure relative to the proposed arrangement.

Comprehensive coverage

20. The discussion of 'comprehensive coverage' in the Draft Determination raised several issues in a way that was ambiguous as to the Commission's overall concern. For the purposes of our report, we have assumed the Commission's primary concern is the extent to which competing trading arrangements would be likely to develop. The Commission appears to suggest, tentatively, that competing arrangements are more likely under the counterfactual.

21. Our approach to this issue is to be very clear about whether the operational rules initially adopted under the counterfactual would be same as specified in the proposed arrangement. The Commission appears to agree with our view that this would be the case.
22. Comparison of the proposed arrangement relative to the counterfactual then reduces down to two issues. The first issue is whether the Crown EGB would be more likely than the Industry EGB to grant exemptions from the rules. The second issue is whether a rule change to better facilitate competing trading arrangements would be more likely under the counterfactual than the proposed arrangement. We find no basis for expecting either to be the case.
23. An important point to note is that in both cases Transpower would play a central role as a provider of essential services. In this regard, Transpower's strongly held view that there should be only one set of mandatory physical trading arrangements is worth noting.

2 Guiding Principles

2.1 The Commission's view

24. The Commission considers that to the extent that the Guiding Principles vary from the GPS, there is some potential for the proposed arrangements to lessen competition, or otherwise harm consumer welfare, compared with the counterfactual (para 222).

2.2 Summary of our analysis

25. Our response to the Commission's view may be summarized as follows:
- There is a high level of commonality between the Guiding Principles and the GPS. The Guiding Principles promote the same outcomes as expressed in the GPS, and establish the same requirements for rules.
 - The relevant question for public analysis is not how closely the Guiding Principles are aligned with the GPS, but rather whether the Guiding Principles are superior or inferior to the GPS in performing their intended role. That role is to provide assurance and high level guidance to decision-making in uncertain times and situations.
 - The Guiding Principles in the proposed arrangement follow the existing arrangements (MARIA, MACQS and NZEM) very closely. By retaining wherever possible the language from the existing codes (while remaining consistent with the GPS), the industry retains as much as possible of the six years of precedent and understanding developed through the use of the Guiding Principles in rule making under the existing codes. This lowers the transaction costs that would otherwise be incurred through adopting new language to achieve the same ends.
 - In contrast, the guiding principles section of the GPS is not well expressed in terms that are recognisable as principles that could be inserted into a legally binding contract. If the GPS principles had been used as expressed, the Board, the Rulings Panel and the courts would be legally constrained to judge proposals for rule changes against particular outputs rather than in terms of principles. We consider that the Crown EGB would come to recognise the practical limitations of the Guiding Principles in the current GPS and would, over time, seek to change them to be closer to the Guiding Principles in the proposed arrangement.
 - The Guiding Principles are likely to perform better their intended role because the Guiding Principles are likely to be more enduring, have less potential for conflicts, and higher discriminatory power than the GPS.

2.3 The role of principles

26. The primary roles of the high-level principles are to:
- Provide guidance, stability and consistency in uncertain times and situations; and
 - Provide assurance to parties who are affected by the arrangements (the proposed arrangements or the counterfactual) that the arrangements will be governed in a consistent and rational manner.
27. High level guidance and assurance are important because it is impossible to design a governance arrangement for the electricity industry that is complete in the sense of specifying rules for every situation. Any governance arrangement inevitably will be incomplete in many respects and the rules will need to evolve as unforeseen situations arise and in response to changes in the industry and the broader external environment. In addition, since even well-defined rules may be open to different interpretations in some circumstances, high level guiding principles are useful in reducing the risk of misinterpretation and providing consistency.
28. The Guiding Principles in the proposed arrangement follow the existing arrangements (MARIA, MACQS and NZEM) very closely. By retaining wherever possible the language from the existing codes (while remaining consistent with the GPS), the industry retains as much as possible of the six years of precedent and understanding developed through the use of the Guiding Principles in rule making under the existing codes. Retaining the language of the existing principles thereby lowers the transaction costs that would otherwise be incurred through adopting new language to achieve the same ends.

2.4 Consistency between the GPS and the Guiding Principles

29. The Guiding Principles promote all of the Government's desired outcomes expressed in the GPS:
- The guiding principles "promote efficient use of scarce resources" and "foster competition" address outcomes (a) - (d) and (f) in the GPS.
 - The guiding principle "foster performance desired by consumers" promotes outcome (e) in the GPS
 - Outcome (g) in the GPS can be achieved through the guiding principles "foster economic welfare" and "promote efficient use of scarce resources". These principles require a net benefit from reductions in greenhouse gas emissions rather than minimisation at all costs.

30. The Guiding Principles also meet all the Government's requirements for the rulebook:
- Requirement (h) – (k) and (n) in the GPS are met by the guiding principles “promote efficient use of scarce resources” and “foster competition”.
 - Requirement (l) – (m) are met by the guiding principle “facilitate decisions on common services”.
 - Requirement (o) and (q) are met by the guiding principles “unbiased and transparent evolution of rules” and “be robust and enforceable”.
 - Requirement (p) is embedded in the Rulebook
 - Requirement (r) is met by the guiding principle “comply with the law”.

2.5 Relative merits of the Guiding Principles and the GPS

31. Since both the GPS and the Guiding Principles are means to a common end, relative merit should be assessed by examining performance in achieving that end. Even though the proposed Guiding Principles are consistent with the GPS, the more relevant question is whether they are superior or inferior to the GPS in performing the intended role, namely to provide guidance, and assurance of consistency and stability in uncertain times.
32. In this section, we assess the relative merits of the Guiding Principles and the GPS using the following five criteria¹.
- Be self-evident in their merit
 - Be enduring
 - Comprehensive and encompassing
 - Avoid the potential for conflicts between the principles
 - Possess discriminatory power.

Self-evident in their merit

33. Both the Guiding Principles and the GPS meet this criterion in that they both set out desired high level objectives which are non-controversial. However there is a degree of ambiguity in the GPS. For instance, the GPS states some specific outputs sought by the Government:

“a) ... hydro spill is minimised.”

...

“g) Greenhouse emissions are minimised”

¹ These are the same five criteria used in Dr Graham Scott and Professor Jonathan Macey, *Peer Review of Conceptual Design and Guiding Principles*, 28 June 2001.

34. It is not clear in what context these outputs should be pursued. Greenhouse emissions can usually be further reduced but after a certain point the cost would outweigh the benefit. The specified outcomes in the GPS do not provide guidance to the industry on the appropriate trade-offs.

Enduring

35. The Guiding Principles are suitably pitched at a high level, and likely withstand the test of being stable over time.
36. In contrast, the GPS sets out specific outputs that the Government desires. These specific outputs are pursued by the current Government and influenced by current policy concerns. With a change of government and shifts in policy concerns, the specific desired outputs are likely to change. For instance, different emphasis may be put on specific outputs such as minimisation of hydro spills, greenhouse emissions, and transmission constraints, etc. Although it is difficult to predict how the specific outputs may change, the fact that these specific outputs are not stable over time makes the guiding principles in the GPS less enduring relative to the Guiding Principles for the proposed arrangements. This instability is evident in the GPS being amended after less than one year, whereas no amendment has been necessary to the NZEM Guiding Principles in 6 years.

Encompass a wide range of circumstances and issues

37. As discussed earlier, the GPS and the Guiding Principles cover the same areas and similar issues relevant to the electricity industry. However, the Guiding Principles do not state specific outputs as the GPS does, thus the Guiding Principles are potentially more encompassing with respect to unforeseen issues that may emerge in the future.

Avoid the potential for conflicts between the principles

38. There are some obvious conflicts between the principles within the GPS. For instance, appropriate trade-offs need to be made in achieving the following desired outcomes:

“d) delivered electricity costs and prices are subject to sustained downward pressure;

...

g) greenhouse gas emissions are minimised.”

39. The GPS provides no guidance to the industry on how it should make trade offs in the face of conflicting objectives. In comparison, the Guiding Principles are more likely to avoid the potential for conflicts, and provide better guidance on an appropriate trade-off. Guiding Principle 1, “Forster economic welfare” is consistent with the Government’s overall objective for the electricity industry and offers a more unifying metric for assessment. With the metric of economic welfare, the Guiding Principles appears to better reconcile potentially conflicting outcomes such as downward pressure on energy prices and

minimisation of greenhouse gas emissions. In addition, the Guiding Principles puts more emphasis on advancing consumer welfare through well-developed market mechanisms and governance processes. A well-functioning market mechanism can potentially assist the achievement of an optimal trade-off through de-centralised processes that take most advantage of valuable private information.

Possess discriminatory power

40. A guiding principle with high discriminatory power is sufficiently clear in meaning so that judgments can be made as to whether or not the rules (or proposed rule changes) are consistent with them.
41. The GPS is fairly specific about the Government's desired outcomes, but is non-specific about appropriate processes and mechanisms for achieving them. Consequently it offers very limited guidance on whether a given set of rules or rule changes are likely to achieve the desired outcome and therefore are consistent with the guiding principles in the GPS. The lack of discriminatory power leaves much at the discretion of the Crown EGB, which increases the risk of regulatory error.
42. In comparison, the Guiding Principles in the proposed arrangement set out both high level objectives/directions, as well as the mechanisms and processes that are designed to achieve these objectives. These mechanisms and processes are specified in appropriate levels of detail so that they offer useful guidance in assessing governance rules and rule changes and at the same time remain stable over time.

2.6 Assessment

43. We assess that the divergence in the Guiding Principles does not create a potential for the proposed arrangement to lessen competition or harm consumer welfare. Three particular advantages we emphasise are:
 - The Guiding Principles are more robust and internally consistent compared to the specific outcomes listed in the GPS;
 - The Guiding Principles are written in a form more suitable to a legally binding contract; and
 - The Guiding Principles adopt the language of the existing codes so that the industry retains as much as possible of six years of precedent and understanding.
44. On this basis, the Guiding Principles are likely to serve as clearer criteria for assessing future rule changes and may be more effective in achieving the Government's overall objective for the industry.
45. Although we assess the Guiding Principles would provide a net benefit relative to the GPS, we have not developed a quantitative estimate for inclusion in the assessment of benefits and detriments (Section 7). We consider that the Crown

EGB would come to recognise the practical limitations of the Guiding Principles in the current GPS and would, over time, seek to change them to be closer to the Guiding Principles in the proposed arrangement.

3 Pro-competitive rule changes

3.1 The Commission's views

46. The Commission accepts that the industry would be more competent in assessing the merits of a proposed rule change than a Crown EGB (para 406). However, the Commission expressed concern that voting rights for some chapters will be concentrated in the hands of vertically integrated generator-retailer companies (paras 223-243). The Commission considers that existing generator/retailer companies may have incentives to block or delay rule changes that would have the effect of lowering barriers to entry, or enabling greater competitive discipline.
47. The Commission has accepted that not all pro-competitive rule changes would be rejected under the voting process (para 435). It noted that consistent voting down of pro-competitive rule changes would be readily transparent and might lead to Government intervention.
48. In terms of the counterfactual, the Commission recognised that the same underlying pressures would likely result in the Crown EGB and the Minister being subject to lobbying against pro-competitive rule changes. However, the Commission considers the pressures would lead to weaker competition in the proposed arrangement than under the counterfactual.

3.2 Summary of our analysis

49. Our view of the concerns raised by the Commission concludes that:
 - The proposed industry arrangement reduces the likelihood of pro-competitive rule changes being blocked, for the following reasons:
 - Firstly, no single industry participant can veto a rule change. The different production processes of the generators and their varied locations on the grid make it difficult to conceive of an efficiency enhancing rule change that would simultaneously disadvantage a majority of existing companies. The counterfactual contains the risk that concentrated interests may persuade the single decision-maker.
 - Secondly, the proposed arrangements contain a carefully designed decision-process that is open and transparent and intended to ensure that all proposals are considered on their merits. The counterfactual encourages lobbying, rather than participation in technical working groups.
 - Thirdly, any rule change that would improve competition would release value. The clearer definition of decision-rights under the industry process should facilitate bargains between parties that would gain from a change and those that would lose. That is, the arrangements facilitate changes which economist call Pareto Optimal – changes that make at least one party better off without making any party worse off. The

counterfactual would allow rule changes to proceed that made one entity better off at the cost to all other parties.

- Fourthly, the Government may declare the objectives for the industry EGB, will negotiate performance standards with the EGB annually under Part XV of the Electricity Act, and two officers of Parliament report annually on progress against those objectives and standards. This provides a mechanism for the Government to apply continued pressure should concern emerge that pro-competitive rules changes were being delayed or blocked.
- Fifthly, there are inherent incentives on the transmission provider and system operator to over emphasize system security at the expense of competition. The industry arrangements provide countervailing tensions, whereas this competitive risk is exacerbated under the counterfactual.
- Evidence from NZEM voting records supports this qualitative analysis, in that:
 - No pro-competitive rule changes put to the vote in NZEM have been voted down
 - The duration for pro-competitive rule changes to be processed is no longer on average, and may be shorter, than neutral rule changes.

3.3 A basis for comparing decision-making processes

3.3.1 Matching governance to the transaction

50. In matters of governance, the starting point for analysis is the transaction being governed. This is because firms and individuals engage in transactions to improve their well-being. Governance provides order to these transactions where the potential for conflict may threaten opportunities for mutual gain and different types of transactions will be governed efficiently in different ways.
51. The transactions relevant to this analysis concern the terms and conditions under which owners of various electricity resources conduct business. The transactions may also encompass aspects of the relationship between suppliers and end consumers (especially direct connect consumers, but also other consumers for instance those buying wholesale).
52. Changes to the rules will alter potentially the value of electricity transactions and hence company and asset values. The Commission is being asked to assess which decision-making process – the industry proposal or the Crown EGB – is likely to result in superior decisions over time, where superior is measured in terms of contribution to economic welfare.
53. Relative contributions to economic welfare will be determined by the comparative effectiveness of each decision process undertaking the following:
 - Specification of the appropriate variables in question;
 - Monitoring or measurement of compliance with what has been specified; and

- Enforcement of, or assuring compliance with, what has been specified.
54. The relative effectiveness of the alternative decision processes in undertaking these elements of decision-making can be evaluated by comparing the:
- Information brought to bear;
 - Competencies of the decision-makers at each stage in the process;
 - Way in which conflicting views and interests are resolved; and
 - Incentives of the parties involved.

3.3.2 Identifying adverse incentives

55. The Commission appears to accept that the industry arrangement is superior in terms of the information, competences, and conflict resolution processes relative to the Crown EGB. However, the Commission raises concerns about the incentives on decision-makers, and in particular is concerned that integrated generator-retailer companies may strike down pro-competitive rule changes. This section evaluates the incentives on all key decision-makers in the process. It identifies two potential sources of tension in relation to pro-competitive rule changes. The following section evaluates the alternative decision-processes against an objective of minimizing the sum of these potentially adverse incentives.
56. Experience over the past decade suggests that ongoing technical progress, and better understanding of the potential for market processes in the electricity sector, brings with it the prospect that the rules could or should evolve to permit progressively greater diversity and differentiation. Demand-side participation, real time pricing, and distributed generation are examples of changes which have been debated and which would significantly change current practices.
57. New technologies and processes create at least two risks in any inter-connected system. One risk is that competing assets based on older technology or industry arrangements may be less commercially viable relative to new technologies, and in the extreme may become 'stranded assets'. Incumbent generators have an incentive to protect against this risk. The Draft Determination focuses on this risk.
58. The second risk is that new technologies or processes may affect the operation and commercial viability of complementary assets and services. In the electricity sector, the national grid is a key complementary asset that may be put at risk by new technology developments. The examples mentioned above - demand-side participation, real time pricing, and distributed generation - each have potential to affect significantly the operation of the grid and the value of specific assets. Some effects may be anticipated and modelled in advance, while other effects may be entirely unexpected.

59. The system operator role is a complementary service that is also affected by pro-competitive rule changes.² The system operator is particularly concerned to ensure that any failure is not exacerbated by other generation or transmission assets tripping off (to avoid being damaged). These concerns give the system operator a strong incentive to promote uniform standards on connected equipment and mandatory processes relating to dispatch and other real time actions.
60. In contrast, pro-competitive rule changes tend to work in the opposite direction by permitting greater diversity and differentiation. Transmission operators tend to have little to gain from increased competition in the market place, but may bear considerable responsibility for any failure in a market process. Hence, transmission operators tend to take a highly conservative approach to new technology and processes.
61. In the same manner, irrespective of whether system security would be affected, the system operator's task would increase in complexity and costs when relaxation of rules permit greater diversity and differentiation. The system operator therefore will tend to take an overly cautious approach to pro-competitive rule changes.

3.3.3 Transpower is not immune to these incentives

62. As the owner and operator of the national grid and system operator, Transpower is not immune from these incentive effects. Annex 1 presents samples of Transpower's written statements and market actions which show Transpower responds to the incentives it faces in much the same way as transmission operators worldwide. The study quotes a number of Transpower statements in favour of a mandatory dispatch wholesale market and uniform equipment standards. The study also presents several examples where Transpower operating policies have delayed developments that would likely be significantly pro-competitive.
63. The study shows that the risk to pro-competitive rule changes is substantive and warrants consideration by the Commission. It reflects that the nexus between system security and the efficiency benefits of decentralization and differentiation is a key tension in a dynamically evolving the electricity industry.

3.4 Industry process tends to resolve these tensions

64. The incentives effects arising from new technology and process innovations are inherent to the transactions being governed. The key issue for the Commission is which institutional structure – the industry arrangements or the Crown EGB -

² The role of the system operator (undertaken by Transpower) is to match desired injection and off-take of energy and reserves so to maintain common quality within specified ranges. The process involves predicting the consequences of generation and transmission failures and identifying the back up resources available to it in the event of a failure occurring.

provides appropriate countervailing incentives to ensure outcomes are efficient overall.

3.4.1 Balancing system security and competition concerns

65. The different decision structures in the proposed arrangement and counterfactual are critical in this respect. The proposed arrangement balances Transpower's incentives by allocating voting rights to the members whose contractual and legal rights are affected by the actions taken or not taken by the transmission provider and system operator.³
66. In each case, the parties allocated votes have a direct incentive, when welfare gains are available from increased flexibility, to counter the transmission provider/system operator incentive in favour of uniform and prescriptive rules. This is because the voting parties observe directly the lost opportunities caused by restrictions on their business operations.
67. The counterfactual, on the other hand, allocates the core decision right to the Minister of Energy on the recommendation of the Crown EGB. As agent of the Minister, the Crown EGB would tend to face similar incentives as the Minister. The economics literature suggests that the incentives on political decision-makers are to favour concentrated interests at the expense of more diverse interests, such as tax payers and/or consumers. This occurs because concentrated interests can sustain an active interest in the regulatory process.
68. In the face of opposition from the transmission provider/system operator, the Crown EGB and Minister would have difficulty in judging whether a trade-off between competition and security exists and the extent of the trade-off. In the presence of uncertainty, the Crown EGB and Minister are likely to favour Transpower's views even though the benefit from competition may outweigh that from the perceived increase or retention of security.
69. Rejecting Transpower's views would carry substantial political risk in the event of a failure (irrespective of whether it related to the specific rule change). In contrast, the losses from rejecting a pro-competitive rule change would be unobservable to the general public (except for special interest groups), and could be defended politically by reference to Transpower as expert on security issues⁴. The political difficulty for the energy minister in crossing advice from

³ In regard to common quality (Part C), votes would be allocated to connected entities because the performance of their equipment is affected by the level of common quality and they bear the cost of restrictions on asset characteristics that may be connected to the grid or distribution line. In regard to transport services (Part F), votes for changes in services would be allocated to those whose contracted service levels would be altered by the service change. In regard to the wholesale market (Part G), votes would be allocated to the parties who trade over the grid.

⁴ Tranpower argues that "there is need for a strong party in the industry to make the appropriate tradeoffs between system security and customer costs. Under the Government Policy Statement that would be an independent electricity governance board assisted by

transmission experts, would be higher than those faced, say, by the health minister in going against advice from medical experts.

70. For similar reasons, the Commission accepted in the Draft Determination that the counterfactual would likely result in over-investment in transmission services. Our position is that the same arguments apply to decision-making in relation to pro-competitive rule changes. This implies that the counterfactual would lead to an over emphasis on system security and stable rules at the expense of enhancing competition.

3.4.2 Incentives to remove barriers to entry

71. From carefully reviewing the decision-making processes, we conclude that the proposed arrangements reduce the likelihood of pro-competitive rule changes being blocked, relative to the counterfactual, for the following reasons:

- Firstly, no single industry participant can veto a rule change. The different production processes of the generators and their varied locations on the grid make it difficult to conceive of an efficiency enhancing rule change that would simultaneously disadvantage a majority of existing companies. The counterfactual contains the risk that concentrated interests may persuade the single decision-maker.
- Secondly, the proposed arrangements contain a carefully designed decision-process that is open and transparent and intended to ensure that all proposals are considered on their merits. The counterfactual encourages lobbying, rather than participation in technical working groups.
- Thirdly, any rule change that would improve competition would release value. The clearer definition of decision-rights under the industry process should facilitate bargains between parties that would gain from a change and those that would lose. That is, the arrangements facilitate changes which economist call Pareto Optimal – changes that make at least one party better off without making any party worse off. The counterfactual would allow rule changes to proceed which made one entity better off at the cost to all other parties.
- Fourthly, the Government may declare the objectives for the industry EGB, will negotiate performance standards with the EGB annually under Part XV of the Electricity Act, and two officers of Parliament report annually on progress against those objectives and standards. This provides a mechanism for the Government to apply continued pressure should concern emerge that pro-competitive rules changes were being delayed or blocked.
- Fifthly, there are inherent incentives on transmission provider and system operator to over emphasize system security at the expense of competition. This anti-competitive risk is exacerbated under the counterfactual.

Transpower.” Letter from Transpower Chief Executive, Mr Bob Thomson, to the Minister of Energy Hon Pete Hodgson, 25 February 2002, released to EGEC.

3.5 Industry process likely to produce greater welfare gains

72. Compared with the Crown EGB, the industry decision processes are superior in terms of the:

- Information sought to bear.
- Competencies of the decision-makers at each stage in the process.
- Way in which conflicting views and interests are resolved.

The industry process also provides countervailing tensions to incentives to block pro-competitive rules. The Crown EGB, however, would encourage potentially welfare reducing behaviour in terms of the trade-offs between customer costs (reduced through competition) and system security. It would also encourage rent seeking and other forms of welfare reducing behaviour.

The six years of experience with the NZEM decision processes are likely to be relevant in considering whether the concerns raised by the Commission are likely to be material. This is because the decision process in the proposed arrangement is broadly similar (with some important changes discussed further below).

3.6 Evidence from NZEM on voting behaviour

73. This section reports on a study of NZEM undertaken at our direction (refer Annex 2A). The analysis covers the voting record on every rule change proposal lodged since NZEM began operations in October 1996.

74. We developed narrow and wide definitions of pro-competitive proposals based on the Guiding Principles. Of 90 rule change proposals in total, 7 were classified as pro-competitive under the narrow definition, and 27 under the wide definition.

75. Irrespective of the definition used, NZEM records show that all pro-competitive rule changes put to the vote were adopted. Further, under both definitions, the substantial majority of pro-competitive changes received 100% vote in favour from both generator class and purchaser class participants.

76. The analysis is robust to the definition of pro-competitive rule changes due to the fact that virtually all rule change proposals put to the vote have been accepted by NZEM members. Since October 1996, only two proposals put to the vote have been rejected, one of which the NZEM Market Administrator asked members to vote down because the proposal contained an administrative error.

77. The class voting structure in NZEM means these results are a relevant indicator of likely voting behaviour under of the proposed arrangement. This is because the NZEM requirement to achieve majorities in both generator and purchaser

classes means that generators have had the potential to block pro-competitive rule changes since October 1996.

78. In conclusion, our study has found no evidence to support the Commission’s concern that pro-competitive rule changes are at particular risk of being voted down by generator/retailer companies. The evidence lends weight to our qualitative arguments presented above.

3.7 Evidence from NZEM on working group processes

79. The section above reported actual voting behaviour once a proposal was put to the vote. The following reports on our study of NZEM working group processes prior to a rule change proposal being put to the vote. The study was aimed at identifying whether pro-competitive rule changes are subject to greater delay and periods of hold up in pre-voting processes compared for proposals that are competitively neutral.
80. In NZEM the process for considering a rule change proposal comprises the following main steps:
- Proposal lodged with the Market Administrator is forwarded to Rules Committee.
 - Rules Committee decides whether to consider rule change itself, forward it to an existing or new working group, or reject as vexatious or trivial.
 - Working group has 60 days to consider and report back to Rules Committee (the working group can apply for an extension).
 - Rules Committee considers the working group report and decides whether to accept or reject the recommendation.
 - Grid Operator decides whether to give consent.
 - Rules Committee makes decision to put to a vote.

Statistical analysis

81. A simple test is to compare the number of days duration from lodgement of proposal through to voting for neutral and pro-competitive rule changes. Table 2 presents the mean and median for both narrow and wide definitions of competitiveness.

Table 2: Number of days duration of pre-voting process

	<i>Mean</i>	<i>Median</i>
Narrow definition		
- Neutral	365	207
- Pro-competitive	118	132
Wide definition		
- Neutral	281	207
- Pro-competitive	505	218

82. At first sight, the results present a confused picture, with the average duration swinging sharply from favouring pro-competitive rule changes under the narrow definition to the reverse picture under the wide definition. However, with the relatively small number of observations, the sharp swing in mean duration is caused by substantial periods of time used in processing a small number of rule change proposals.
83. In the presence of a skewed distribution, the median presents a more accurate picture. Table 2 shows that under the wide definition of pro-competitiveness the median duration for pro-competitive rule changes is comparable to the median for neutral changes. Under the narrow definition, pro-competitive rule changes have a substantially lower duration than neutral rule changes.

Case studies

84. The statistical results indicate that a relatively small number of rule change proposals have taken a long time to process. Also, a number of significant rule change proposals remain in the NZEM process at the current time. To complete our analysis of NZEM, we conducted case studies on ten issues where rule changes had been rejected or took substantial periods of time to process (see Annex 2B).
85. Of the ten topic areas studied, we found the following:
- In two areas, the proposals were rejected following rulings by the Market Surveillance Committee that the proposals were contrary to the Guiding Principles;
 - In six areas, either disagreements arose between NZEM and Transpower or the issue fell under Transpower jurisdiction rather than NZEM; and
 - In two areas, proposals were rejected by the working group. One rejection was based on the proposal being contrary to the Guiding Principles, while the other is not clear from the records.
86. On the basis of the case studies, we find no substantive evidence to support a hypothesis that the generator/retailer entities have delayed or held up the processing of rule changes. In several cases, the issues are highly complex and go to the core of how the market functions. In these circumstances, it would seem appropriate that thorough analysis and debate be undertaken as part of considering rule changes.

3.8 Better process under the Proposed Arrangements relative to NZEM

87. As discussed above, experience with NZEM to date suggests that, by and large, the rule change process has worked well. The most reliable statistical measure, the median, suggests there has been no bias against pro-competitive rule changes. The rule change process under the proposed arrangement improves

on the process in NZEM, which further reduces the risk of pro-competitive rule changes being delayed or struck down. In particular:

- Any person, as opposed to just existing participants, could propose a rule change.
- The independent EGB could ensure pro-competitive rule changes are given appropriate priority.
- The removal of requirement for consent by Transpower would reduce the risk of pro-competitive rule changes being blocked, particularly in cases where pro-competitive rule changes may lead to heterogeneity that makes Transpower's tasks more complex.

4 Transmission under-investment

4.1 The Commission's views

88. In analysing the public benefits and detriments of Part F the Commission expresses concern that distributors would not necessarily have an interest in approving new transmission investments to relieve transmission constraints, resulting in under investment in transmission assets. The Commission also notes Transpower's concern that quantum meruit may not provide it with sufficient certainty to invest.
89. The Commission estimates the detriments from under investment might range from \$29-\$54m NPV.

4.2 Summary of our analysis

90. This section responds to the Commission's views by identifying the existing contracting problems for transmission services and showing how Part F in the Proposed Arrangement would be likely to overcome these problems better than would the counterfactual. The key elements of our response are:
- Section II of Part F does not predetermine which generators, lines companies, end users, etc, might gain from a transmission investment, but instead allows coalitions to be formed sufficient to support the investment;
 - Parties who have no incentive to support the investment (eg. lines companies in cases where they receive insufficient benefit) do not need to be part of the coalition and therefore would not be allocated votes;
 - Although forming coalitions involves transaction costs, there are reasons to believe the hurdle to new investments would be small;
 - The counterfactual also bears transaction costs as the Crown EGB must gain sufficient information to interpret customer preferences (and the trade-offs inherent in those preferences) and determine a price, quality and method of delivery that meet the demands of transmission customers in a manner that can be supplied by the provider. A government regulatory body is likely to face higher costs of such activity than the industry participants under the proposal;
 - The use of regulatory force creates a high probability of detriments because:
 - Research of the electricity sector worldwide shows that the central planning process (even with sophisticated mathematical models) consistently fails to anticipate risk adequately;
 - Potential suppliers of alternative transmission services (eg. lines companies) and suppliers of substitute services (eg. distributed generation) face increased risk of being over-ridden by Crown EGB instructions to Transpower to invest;

- Lines companies face greater risk of being forced to bear the costs of investments they believe would not earn an appropriate return. Depending on the regulation implemented under Part 4A, lines companies would either face higher cost of capital or face a strong financial incentive to promote insufficient investment that can be added to their rate base;
 - The Crown EGB would have power to override the lines companies' voting decisions even when the lines companies consulted with their customers, whereas the Industry EGB could override lines companies only when the line companies had not engaged in an appropriate consultation process; and
 - The claim that Transpower is forced to rely on quantum meruit to recover costs is fallacious. Transpower is at risk only where it decides *unilaterally* to invest without a contract or agreement to supply the service, in which case quantum meruit is the appropriate test.
91. The following subsections elaborate on these points, in the context of the Part F process under the proposed arrangement and our understanding of the Commission's counterfactual.

4.3 Counterfactual

92. The Commission considers that the processes in Part F are likely to be adopted by a Crown EGB. However, in the Commission's counterfactual, the Crown EGB would likely have powers to (paragraph 320):
- Force transmission investments which the Crown EGB considers are in the national interest; and
 - Allocate the costs of transmission investments the Crown EGB considers are in the national interest.
93. Regulations would be passed to require transmission purchasers to pay transmission charges according to prices determined by a confirmed pricing methodology (including a pricing methodology authorised or determined by the Commission).
94. The Draft Determination appears to imply that the power to force a provider to invest in transmission services would be restricted to Transpower, rather than to alternative providers of transmission services (e.g distribution lines companies) or providers of substitutes (such as generators or load reduction). The Commission does not specify the parties that would be required to pay for such investments, but for the purposes of analysis anticipates that the majority of the costs would be allocated to distribution lines businesses.
95. We concur with the Commission's view of the counterfactual for the purposes of analysing the public benefits and detriments of Part F. We would anticipate, however, that the Crown EGB would have an increasing influential role in transmission investments over time for the following reasons:

- As the Crown EGB would face weak incentives to minimise transmission investment (for the reasons stated by the Commission at paragraph 427), Transpower would likely seek to engage the Crown EGB as early as possible.
- As the Crown EGB would sign-off and enforce transmission pricing, it would face pressure to sign-off the underlying investment.

4.4 Commission’s conclusions on under-investment

96. The Commission concludes that the proposed industry arrangement will result in significant under-investment in transmission services. This conclusion appears to be based on the following reasoning:
- Electricity lines businesses would likely hold the majority of voting rights in future investment decisions (because lines businesses have historically paid for most of Transpower’s costs).
 - Electricity lines businesses have only weak incentives to approve investments to relieve transmission constraints (but would likely support investments to maintain security and quality of supply).
 - A Crown EGB established under the Electricity Act would force investments that result in a net public benefit.
97. Before evaluating these assumptions, the following sections outline the benefits expected from transmission investment and the contracting problems which to date have impeded contracting to realise those gains.

4.5 Gains from transmission investment

98. To understand the choices and incentives facing decision-makers under the proposal and the counterfactual, it is worth recalling the principal benefits that transmission services provide to electricity markets. These benefits can be characterised as:
- The transport of electricity from locations where it can be produced comparatively cheaply to locations where it is valued more highly;
 - Pooling generation capacity (and interruptible load) and thereby reducing the total amount of generating capacity needed to service reliably a given demand profile; and
 - Increasing the size of the energy market, and making it more competitive by including more suppliers and users within it.
99. A proposal to invest in transmission assets might be aimed at:
- Maintaining these benefits - ie. maintaining existing service levels; or
 - Achieving new or increased gains – ie. increased or new services (including increased security or reliability of existing services).

4.6 Contracting problems perceived to impede transmission investment

100. Given the size of the industry, and the potential impact of transmission constraints on feasible market transactions, the value realised from transmission investment can be significant. As with any other service, these benefits will be exploited fully only when transmission customers are able to purchase the level and range of transmission services that best meet their needs, and for which they are willing to pay.
101. In developing the Part F arrangements, the Transport Working Group (TWG) identified the following key problems as impeding transmission customers from contacting for transmission services:⁵
- A degree of ambiguity over the terms and characteristics of the transmission services currently being bought and sold;
 - Lack of pricing and price signalling of some aspects of transmission services, such as changes in reliability and the signalling of constraints to end use customers;
 - Incomplete information and other limits to opportunities for alternative solutions (including demand side management);
 - Joint consumption of some transmission services, which may lead to free-riding and high transaction costs for bilateral trading;
 - The need for collective decision-making to achieve efficient service levels for common services, which raises risks of 'hold-out' and expropriation;
 - A degree of ambiguity over who are the appropriate contracting parties, or customers of the service; and
 - Concerns that some contracting parties (or customers) may have multiple objectives, possibly affecting their incentives to contract for an efficient level of transmission services.
102. This list of problems was the subject of some discussion within the TWG and EGEC, and appears to be a reasonable summary of the problems perceived by the industry to be impeding transmission investment. The procedures and process set out in Part F are intended to mitigate these problems.

⁵ See the TWG paper to EGEC entitled "Recommended approach to decision making and contracting in respect of transmission services, including grid replacement and expansion issues" 17 April 2001 available on the website: www.egb.co.nz

4.7 How part F addresses contracting problems for new investment

4.7.1 Reducing ambiguity over service levels and prices

103. Section I and Section III of Part F are intended, amongst other things, to provide a foundation for future decisions on transmission investment by removing ambiguity over services currently provided by Transpower and the price of those services. Although the processes in these sections are not a point of difference between the counterfactual and the proposal, the processes are relevant to identifying the extent to which any remaining contracting problems might best be addressed through a Crown EGB governance structure.
104. If transmission customers are currently unsure of the services they are entitled to in return for their money and how that entitlement would alter if they agreed to underwrite additional investment, it will be difficult for them (or anyone else) to make efficient decisions on new investment. Section I is designed to reduce that ambiguity and to result in service definitions, measures, and levels being recorded in contracts. Section III describes the process for determining how the charges for such services are allocated.

4.7.2 Collective decision-making on common services

105. Section II of Part F contains procedures which transmission providers (including providers of substitutes for transmission services) and purchasers may use to agree changes in transmission services, or the introduction of new services, where those changes affect more than one purchaser. The section does not pre-determine the parties (eg. generators, lines companies, end users etc) that might gain from a transmission investment, but allows coalitions to be formed sufficient to support the investment. This is a significant break from current practice, whereby Transpower elects to contract primarily with distribution lines businesses.

4.7.3 Overcoming hold-out problems

106. The Section II process for new investment ends in a binding vote by transmission purchasers as to whether to accept the proposed investment on the terms offered by the transmission provider. If 75% of the votes cast support the proposal, all parties involved in the vote are bound to the outcome – that is, the provider is bound to provide the service on the terms offered, and all purchasers are bound to pay for the service. These commitments are recorded in contract, and do not rely on quantum meruit arguments.
107. The voting threshold is intended to address the potential for hold-out or free-rider problems. In the absence of a binding vote (or similar mechanism) one party might refuse to support a proposal which it would benefit from in the hope that it would gain some additional benefit from ‘holding out’. Errors of judgment and incomplete information in ‘hold-out’ games could lead to investments being declined although all parties to the vote would have received a net benefit from the proposal and preferred it to proceed.

4.7.4 FTRs should address externalities

108. In addition to these arrangements, Transpower has announced that it will introduce this year a Financial Transmission Right (FTR) product that should reduce substantially the externality problem associated with investing in transmission assets in an open access grid. Externality problems arise because currently the transmission users who fund an increase in capacity of a link are exposed to the risk that lower nodal price differences will induce other users to increase load. An increase in load by other parties may have the effect of partially forestalling the intended reduction in nodal price differences. This 'externality' weakens incentives for transmission users to fund transmission investments.
109. Transpower's FTR product has been designed to address the externality problem by awarding transmission rentals to the parties who fund capacity increases on a transmission link. These rentals compensate the investor for the higher energy prices they pay if other users increase load and push up nodal price differences.
110. Section II also empowers the Board, in certain limited circumstances, to override the decisions taken by distribution lines businesses where there are net public benefits from doing so (this aspect is discussed further below).

4.8 Assessing the Commission's assumptions on decision-making under the proposed arrangements

4.8.1 Incentives on lines companies is not the core issue

111. In concluding that the proposed arrangements would result in under-investment in transmission, the Commission assumes that lines companies would hold the majority of decision rights on future investments and would face weak incentives to support investment to remove transmission constraints.
112. However, as described above, Section II places no constraints on the parties that may form a coalition to support a transmission service change, other than the requirement to be bound to the rules. Therefore the core issue in assessing the proposed arrangements is not the incentives on any one functional component of the industry (eg. electricity lines businesses) but the transaction costs inherent in forming a coalition of parties sufficient to support the proposed transmission investment – if a transmission investment proposal would result in a net public benefit, there must exist by definition a coalition which if it could be identified would support the proposal.
113. The experience of the NZEM decision mechanisms (described in Section 3 above) shows that decision processes such as those contained in the rulebook do produce coalitions sufficient to support pro-competitive changes.
114. The NZEM experience also shows that there is a cost to identifying such a coalition (the rule making process is far from costless). The information and other transaction costs required to identify a coalition sufficient to support a

transmission investment therefore impose a hurdle under the proposed arrangement. This hurdle might be such that some comparatively low value investments may not proceed compared to a theoretical ideal (a world in which information is costless). However, any public detriment associated with such under investment is likely to be small because:

- Transmission investments by nature are lumpy (ie. infrequent and of comparatively high value) and hence are likely to clear the transaction cost hurdle;
- The transaction cost hurdle is not eliminated by transferring decisions to the center, as costs must be incurred by a Crown EGB in discovering the preferences of transmission customers; and
- If the Part F processes do not work in the sense of achieving transmission investments that give rise to net national benefit, the Government is likely to exercise its regulatory threat. Hence any detriment from the proposed arrangement is likely to be short-lived.

4.8.2 Mitigating regulatory incentives to over-invest

115. Although the core question in relation to the proposed arrangements concerns the transaction costs associated with forming coalitions, regulation of lines businesses may create incentives for Transpower and lines companies to collude to *over-invest*. Incentives to over-invest might occur if the electricity price control regime yet to be implemented by the Commerce Commission contains elements of rate of return regulation. Companies subject to rate of return regulation face financial incentives to expand their rate base so as to increase the volume of returns. This is the so-called Averch-Johnson critique of rate of return regulation and occurs where the cost of capital of the firm is below the regulated cost of capital.⁶

116. The proposed arrangements address this risk by providing a mechanism for the industry EGB to override a vote on a new transmission service where:

- More than 25% of the votes were held by distribution lines businesses;
- The distribution lines businesses did not follow a process of consultation (expected to be contained within the model distribution contracts) with their customers prior to voting on the investment proposal; and
- The EGB believes that overturning the vote would result in a net public benefit.

117. These provisions allow the EGB to override the vote to achieve a net public benefit, but constrain it from second guessing the decisions of electricity lines companies that make transmission investment decisions in consultation with their customers.

⁶ See H. Averch and L. Johnson. "The Behaviour of the Firm Under Regulatory Constraint," *American Economic Review*, December 1962.

4.9 Assessing the Commission's assumptions on decision-making under the counterfactual

118. In contrast to the proposed arrangements, under the counterfactual the Crown EGB would have the power to force Transpower to make investments the Crown EGB considers are in the national interest. Any allocation of those costs would be backed by regulation.
119. An ability for the Crown EGB to force investment decisions holds the potential that investments which would give rise to a net public benefit, but for which a supporting coalition could not be achieved (eg. because of transaction costs) might proceed. However, this would occur only if the transaction costs involved in ensuring *efficient* decisions on transmission investment by the Crown EGB are lower than the transaction cost of achieving a supporting coalition under the industry arrangements.
120. To make *efficient* decisions in relation to transmission investments the Crown EGB must gain sufficient information to interpret customer preferences and the trade-offs inherent in those preferences, and determine a price, quality and method of delivery that meets the demands of transmission customers and that suppliers are able to provide. Gaining and interpreting such information accurately is far from costless. For efficient decisions, information will be required not just on transmission proposals, but also alternatives to transmission – relocating generation or end use, for instance are substitutes, and in any situation there is a very large number of relocation sites that are conceivably feasible.
121. In addition to these transaction costs, an arrangement whereby an agent of the Minister, the Crown EGB, can instruct an SOE (Transpower) to invest and allocate with regulatory force the costs of that investment would also create a high probability of significant public detriments for the following reasons.

Significant risk of error in Crown EGB investment decisions

122. The experience of the electricity sector worldwide is that despite increasingly sophisticated mathematical models, central planners in the electricity sector are not good at making investment decisions on behalf of customers. For example, a review undertaken by the World Bank of over eighty hydro electric projects completed in the 1970's and 1980's revealed patterns of cost overruns and delays too consistent and persistent across regions, time, and size of projects for these events to be beyond the control of the estimation process.⁷ What emerges is a picture of overly optimistic demand estimates, unrealistic cost estimates, and a failure to allow for physical, institutional, and human problems. In short,

⁷ Cost overruns occurred in 76% of the projects, with cost overruns of 50% or more in 30% of the projects and project delays of over 2 years on more than half the projects. See Mellow, E.W, and Shangraw Jr, R.F 'Understanding the Costs and Schedules of Worldbank Supported Hydroelectric Projects', Industry and Energy Dept. *Working Paper*, Energy Series N.31, The World Bank, Washington DC, July 1990

the central planning process with its net public benefit models failed to anticipate risk adequately.

123. We are not aware of any grounds for considering that a Crown EGB would be immune to these errors.

Crown EGB would 'crowd out' private investors

124. Section II of Part F contains a mechanism that is expected to open parts of transmission to effective competition for the first time. This would be achieved as alternative providers of transmission services and providers of substitute services utilise the mechanisms to gain sufficient support for their investment proposals.

125. The Crown EGB could be expected to 'crowd out' that competition for two reasons:

- First, under the counterfactual developed by the Commission, the Crown EGB could instruct Transpower to invest and would require entities it specifies to pay the cost of that investment. Transpower would thereby gain secure returns, whereas alternative providers would wear the full commercial risk of developing and marketing alternative solutions. The security of payment would insulate Transpower from normal commercial risks that alternative solutions providers in the industry must face, thus creating a bias in favour of investment by Transpower and strengthening Transpower's incentive to over-invest; and
- Second, developers of alternative solutions may not only find their target market taken by Transpower under instruction by the Crown EGB, they may also have to pay for the cost of that service (alternative providers and providers of substitutes are likely to be Transpower's existing customers, such as lines companies and generators). The imposition of charges by fiat will raise business risk, and hence reduce investment.

Incentives for regulated entities would be distorted

126. The Commission does not appear to consider the incentives that would be *created* were the Crown EGB to impose transmission investment costs on distribution lines businesses that had declined to support an investment.

127. Presumably lines companies would support investments for projects in circumstances where they could reasonably expect to share in the gains released by the investment. Hence, the Crown EGB would primarily find itself forcing transmission investments where lines companies had declined the investment because they did not expect to make a margin from the investment. The lines company might not expect to make a return from the investment, for instance, if it anticipated by-pass of the investment, or did not accept the demand estimates that underpinned the investment proposal, or was prevented by regulation from recovering the investment in its prices, etc.

128. Two possibilities would seem to emerge from such a series of events:

- Lines companies would face the risk that they would be forced to bear the costs of investments they believed would not earn an appropriate return. Such an outcome would raise the risk of distribution lines businesses significantly.
- Alternatively, and as is common practice elsewhere, the distribution lines business may be entitled to recover these costs, plus a margin, from its customers. Such an outcome would result in two monopoly sectors – Transpower and electricity lines businesses – facing strong financial incentives to promote inefficient transmission investment.

Crown EGB allowed to second-guess distribution customers

129. Finally, should the Commission prove to be right and most decisions on transmission investment continue to be made by lines companies, then most transmission investment decisions under both the industry EGB and Crown EGB would be subject to being overturned. However, the industry EGB would be constrained in that it could not override decisions taken by lines businesses that had consulted with their customers on their requirements. It seems unlikely that extending the power of the EGB (under the counterfactual) to second-guess the decisions of distribution customers on the services they demand would give rise to a net public benefit. The risk of error by the Crown EGB in these circumstances would likely be very high.

4.10 Uncertainty from quantum meruit

130. The Commission notes Transpower's concern that quantum meruit may not provide it with sufficient certainty to invest. As discussed above, any transmission provider that follows the processes in Section II of Part F of the Proposed Arrangements would be protected through a legally binding contract. In addition, under Part A, Section IX, Rule 3.2, the EGB and the industry take on the credit risk of non-payment of charges payable under the rules that are enforced through quantum meruit.

5 Competitiveness of the transmission market

5.1 The Commission's view

131. The Commission agreed with Murray & Hansen that operational efficiency would be under less pressure in the counterfactual relative to the proposed arrangement. However, the Commission assessed the quantitative magnitude of gains as minimal as it considered the majority of efficiency gains achieved by Part F relative to the status quo would also be achieved under the counterfactual.

5.2 Summary of our analysis

132. The operational gains achieved under the proposal are likely to significantly higher than under the counterfactual. The gains will be higher under the proposal because under the counterfactual the Crown EGB would:

- Crowd out private competitors and hence reduce rivalry and competitive pressure (see section 4 above)
- Be subject to expert advice with a strong bias toward transmission solutions as opposed to substitutes for transmission (discussed below).

5.3 Expert advice would favour transmission solutions

133. As discussed in Section 4, a Crown EGB would likely err in favour of accepting the views of the incumbent transmission provider. Transpower's views are likely to favour transmission investment solutions over solutions by alternative providers or providers of substitutes for transmission, if simply because Transpower will have better information on transmission solutions.⁸

5.4 Competitiveness in transmission services

134. The Commission agreed with Murray & Hansen that operational efficiency would be under less pressure in the counterfactual relative to the proposed arrangement. However, the Commission assessed that the percentage gains would be minimal, an average of 0.55-1.1% compared with 8% average gain in Murray & Hansen. The Commission's assessment is based on the view that the Crown EGB under the counterfactual will have sufficient information,

⁸ During the TWG process, Transpower argued strongly against suggestions that it should have some responsibility for evaluating non-transmission solutions. See, for example, Transpower's paper "*Transpower Issues with Investing in Non-Transmission Assets*", 6 March 2001.

incentives and capability to prevent entry barriers against substitute services for transmission.

- For the reasons set out in Sections 3 and 4, we consider that the industry arrangements are likely to confer pro-competitive benefits relative to the counterfactual. These benefits are quantified in Section 7.

6 Comprehensive coverage

6.1 The Commission's view

135. The Commission states that it is not persuaded that the case has been made for administration, pricing and clearing services to be mandatory (para. 258). The Commission questioned whether individual parties to each transaction should decide how these “non-mandatory” services are provided.
136. The Commission noted that the proposed arrangement provides for the Industry EGB to approve resignations, exemptions and equivalence arrangements. However, the Commission reported that most parties it contacted suggested the Industry EGB would take a cautious approach to granting approvals. The Commission concludes that it is not satisfied that the proposed rules would be likely to lead readily to competing trading arrangements (para. 253).
137. In contrast, under the counterfactual, the Commission concludes that administration, pricing and clearing services may become available on a competitive basis, though the Commission expresses uncertainty as to the extent that competition would be possible or practical (para. 260). The Commission has sought additional comment on this matter.

6.2 Summary of our analysis

138. In our analysis, we have taken the Commission's primary concern as being the extent to which competing trading arrangements would be likely to develop. Our analysis concludes that:
- The operational rules initially adopted under the counterfactual would be same as specified in the proposed arrangement.
 - We find no basis for expecting the Crown EGB to more or less likely than the Industry EGB to grant exemptions from the rules.
 - We find no basis for expecting the Crown EGB to better facilitate competing trading arrangements than the Industry EGB.
139. An important point to note is that in both cases Transpower would play a central role as a provider of essential services. In this regard, Transpower's strongly held view that there should be only one set of mandatory physical trading arrangements is worth noting.

6.3 The basis for comparison

140. The Commission's counterfactual is that the Crown EGB and Minister would initially adopt the operational rules as specified in the proposed arrangement. We agree with this view as the Minister has emphasized repeatedly the need to

have new arrangements established quickly so that important issues can be addressed. Industry parties, including Transpower (see Annex ?2), hold strong views on the efficacy and efficiency of competing arrangements for administration, pricing and clearing services. It appears unlikely that the Crown EGB or Minister would delay implementing the new rulebook so as to undertake consultations in this area. Instead, under the counterfactual, the administration, pricing and clearing issues would be discussed and developed after the rulebook had become operational.

141. On this basis, two distinct issues are relevant for comparing the proposed arrangement and counterfactual:

1. *Application of existing rules:*

Given the initial rules adopted under the counterfactual would be the same as those in the proposed arrangement, how would the decision-makers in the proposed arrangement and counterfactual differ in their application of those same rules?;

2. *Potential to alter the rules:*

If the initial rules proved inadequate to meet the needs of trading parties, how would the rules evolve under both the proposed arrangement and counterfactual?

6.3.1 Application of existing rules

142. The rules relevant to this section are the provisions for resignation under Rule 2 of Section III of Part A.⁹ These rules allocate important decision rights to the Board to determine whether and when to accept a resignation by a member.

143. The criteria for accepting a resignation are:

- The member is not and should not be under investigation or suspension or have outstanding obligations; and
- The member has made acceptable alternative arrangements (the types of arrangements are specified in Rule 2.3).

Industry EGB vs. Crown EGB

144. The Industry and Crown EGB's may be compared in terms of information, incentives and capability.

⁹ Rule 3 of Section I of Part G provides for exemption from aspects of the trading arrangements but its scope is limited to bids and offers and scheduling and dispatch. With the exclusion of pricing and clearing and settlement from the exemptions regime, it would not be possible under either the proposed arrangement or the counterfactual to develop an alternative trading arrangement while remaining a member of the Rulebook. Under proposed rules, the resignation provisions are the only means by which a bilateral physical trading arrangement could develop.

145. In terms of incentives, under the proposed arrangement the Board is required to act impartially, but in practice would be influenced somewhat by the interests of the parties who elect it. Given the voting allocation of 1/3rd each to generators and purchasers, distributors and grid owners, and approved consumer representatives, the interests of voters are broadly based across suppliers and consumers. The Board is likely to identify itself with the preservation and promotion of the proposed arrangement.
146. Similar comments apply to the counterfactual. Under the counterfactual the Board would be required to act impartially but in practice would be influenced somewhat by the interests of the Minister (who appoints directors). The Minister faces the normal political incentives as discussed previously, so that it cannot be assumed that the Minister automatically favours competing arrangements.
147. In both situations the parties who do not favour alternative competing arrangements would lobby for their position. Issues relating to system security, free-riding and cross-subsidisation would be raised as concerns. Under the proposed arrangement, the lobbying would need to be subtle as Board members would protect their reputation for independence. The same would be true for members of the Crown EGB. Lobbying of the Minister would likely be more direct and possibly more intense. This may have a feed back effect on the Crown EGB.
148. Overall, whether the net influence from lobbying would be stronger or weaker under the proposed arrangement versus the counterfactual is uncertain. In the face of arguments about risks to security and potential for free-riding and cross-subsidies under competing arrangements, we assess that under both the proposed arrangement or the counterfactual the Board would tend to be conservative in its decisions.
149. An advantage under the proposed arrangement is that the Industry EGB is likely to be better informed than the Crown EGB. The latter, as a Crown entity acting as agent of the Minister, would inevitably be somewhat removed in its relations with most industry parties.
150. Experience overseas is consistent with this view. A report commissioned by HM Treasury, UK, covering regulatory bodies for electricity and gas, telecommunications, water and sewerage, and rail found consistent results:¹⁰

"The industry stakeholders were consistent in their view that the regulators tend to be overly ambitious, spreading resources over too many initiatives, rather than concentrating on key priorities.... The lack of focus means also that industry is burdened with too intrusive information gathering exercises, the purpose and value of which are sometimes unclear". (pages 3-8)

¹⁰ HM Treasury External Efficiency Review of Utility Regulators, Final Report, prepared by WS Atkins Management Consultants, February 2001.

151. Reflecting its election process, the Industry EGB may be more inclined to maintain regular direct contact with a wider range of industry parties and play an active role in facilitating expert debate on significant issues rather than 'report writing' exercises.

Implicit veto held by Transpower

152. A critical feature of the rules noted above is that any resigning member must make acceptable alternative arrangements. At a minimum this would require a resigning member to reach agreement with the transmission provider, system operator and reconciliation manager, since these are essential services for any party who wishes to trade over the grid. This means that under both the proposed arrangement and the counterfactual, Transpower as transmission provider and system operator would possess an important veto on the development of any new arrangement.
153. Consistent with our analysis in Section 3, neither the transmission provider nor system operator is likely to favour diversity of trading arrangements. Annex 1 presents evidence that Transpower has consistently argued strongly in a favour of a single trading arrangement.

6.3.2 Potential to alter the rules

154. If interested parties were unable to achieve their objectives under the initial rules they would have an incentive to lodge a rule change proposal. The proposal could be for the adoption of an alternative arrangement as a new chapter to the rules. Alternatively, the proposed rule change could be to extend the scope of the Part G exemptions so that the Board has powers to grant exemptions to pricing and clearing.
155. The Commission suggests in the Draft Determination (paras. 260-262) that a rule change would be implemented under the counterfactual to permit choice over "non-mandatory" services, but would not occur under the proposed arrangement.
156. Our analysis questions whether the differences would be significant once the potential for government intervention is taken into account. The analysis is similar to that applied in Annex 3.

7 Reassessment of benefits and detriments

157. This section re-assesses the benefits and detriments based on the qualitative analysis presented in Sections 2 – 6 above plus two technical issues discussed below. The latter involve cost of capital and calculation of dynamic efficiency. The Draft Determination is used as the benchmark, with the following discussion limited to our variations to that starting point.

7.1 Pro-competitive rule changes

158. Following Section 3, we assess the benefits and detriments relating to strike down of pro-competitive rule changes arising from two sources: generator/retailers; and transmission provider/system operator.

Strike down by generator/retailers

159. Section 3 and Annex 3 present qualitative and quantitative evidence on whether strike down of pro-competitive rule changes by generator/retailers is a significant risk. On the basis of voting behaviour under NZEM and the detailed case study of delayed and rejected rule change proposals, we consider that there is no substantive evidence to support the hypothesis that strike down by generator/retailers would be a problem under the proposed arrangement. Moreover, with enactment of the Electricity Amendment Act 2001 (EAA), the 'regulatory threat' has been strengthened considerably as the hurdle against regulatory action has been lowered.

160. Taking all these factors into account, we assess that the risk of strike down by generator/retailers is minimal. Therefore, in contrast to the Draft Determination, we assign zero detriment to this item.

161. If the Commission does not accept this assessment and instead considers the risk to be material, then a consistent framework must be developed to compare the proposed arrangement against the counterfactual. In particular, assumptions about whether the Minister would take a strong or weak stance on competition issues must be applied consistently in both the proposal and counterfactual. In Annex 3 we set out a comparison on this basis.

Strike down by transmission provider/system operator

162. Section 3 suggested that the transmission provider and system operator have an incentive to favour of uniform standards and processes ahead of pro-competitive rule changes. Annex 2 presented qualitative evidence from Transpower's statements and decisions consistent with our analysis, sufficient to that suggest that the risk is real and has consequences for competitiveness in the electricity market. The issue is significant because the transmission provider/system operator's interests span a substantial proportion of the

electricity industry, including all connected equipment (under common quality, Part C), transmission services (Part F), and trading arrangements (Part G).

163. For the purposes of assessing the proposed arrangement relative to the counterfactual it is necessary to show that the transmission provider/system operator incentives would be likely to cause different outcomes under the proposed arrangement relative to the counterfactual. We consider that this is the case since the voting parties under the proposed arrangement observe directly the opportunities lost through restrictions on their business operations, whereas the Crown EGB and Minister would be somewhat distant. Also the political incentives that would lead to over-investment under the counterfactual would make it difficult for the Crown EGB and Minister to take actions contrary to the views of the experts on security, namely Transpower.
164. On this basis, in terms of strike down by the transmission provider/system operator, we assess that the proposed arrangement would confer a benefit relative to the counterfactual. We assess range of benefits on the same basis as the Commission developed in the Draft Determination for strike down by generator/retailers (ie. same estimation framework but opposite sign on the numbers to reflect benefit rather than detriment), with one exception. The exception is that we incorporate a different base for dynamic efficiency calculations as described in section 7.5 below. The impact of this adjustment is to increase the assessed benefit from \$33-\$74m NPV to \$45-\$90m NPV.
165. Annex 3 extends the analysis to incorporate the case where the Minister may take a weak or strong stance on competition issues. As explained in the Annex, we associate a strong stance on competition issues with the lower end of the benefit range and a weak stance with the upper end of the range.

7.2 Transmission under-investment

166. In the Draft Determination, the Commission assessed that the potential for under-investment in transmission services is a substantive weakness of the proposed arrangement. The Commission's key concern about the proposal were that distributors would hold a large portion of voting rights on new investment but would have weak incentives to vote for investments to relieve congestion constraints. The Commission was also concerned that Transpower would face uncertainty through reliance on *Quantum Meruit* and that this would also cause under-investment. On this basis, the detriment in the Draft Determination was assessed at \$29m-\$54m NPV.
167. Section 4 clarifies the situation with respect to both concerns:
- The rules create incentives on the transmission provider to identify parties who are likely to support the investment, so that distributors would receive significant voting allocations only in cases where they would receive benefits from the proposed investment; and

- Transpower would not face uncertainty over recovering investment costs provided it follows the contractual process set out in Part F.
168. A potential cause of under-investment is the transaction cost of forming coalitions sufficient to support an investment. However, the counterfactual also bears transaction costs in gathering and interpreting information on the benefits and costs to transmission users. In addition, the potential that the Crown EGB may use regulatory force to mandate proposed investments increases the risk faced by competing suppliers and companies that would be levied to pay for the investments. These risks could cause under-investment elsewhere.
169. Based on these arguments, we assess that the proposed arrangement is very unlikely to result in under-investment in transmission services relative to the counterfactual. Therefore, in contrast to the Draft Determination, we assign no detriment to the proposed arrangement.

7.3 Competition in the transmission market

170. The Commission included its assessment of the impact of competition in the transmission market in the assessment of over-investment (Draft Determination, para. 426-428). In Table 3 we treat the competition issue as a separate line item.
171. Following the discussion in Section 5, we assess that the proposed arrangement would confer a pro-competitive benefit relative to the counterfactual. We assume that increased competitive pressure would result in operational efficiency gains of 0.25 - 0.5 % in year 1 and rising to 2.5 - 5% by year 10. We consider that this assumption accounts for the risk of crowding out under the counterfactual, while nevertheless allowing room for some efficiency gains to be achieved under the counterfactual.
172. The assessed benefit under the proposed arrangement amounts to \$10-\$20m NPV.

7.4 Cost of capital

173. The Commission acknowledged in the Draft Determination that the counterfactual creates higher regulatory risk, and that this would impact on the cost of capital in the electricity industry. However, the Commission assessed the public benefit to be very small - in the range of \$11-\$22m NPV.
174. The Commission appears to believe that regulatory risk affects the cost of capital for entities that are privately owned, but has no impact on SOEs. This view is incorrect.
175. The cost of capital for an entity reflects the expected return of investors and the expected return reflects the systematic risk of the investment. Apart from regulatory risk, the cost of capital is determined by a range of factors including the market in which the entity operates, and operating and financial policies.

An entity makes choices about those factors, and the choices made will determine the systematic risks and thus cost of capital.

176. While SOEs may differ from private sector entities in some regular manner in terms of the choices made, the basic nature of the activities and environment within which the SOEs operate is the same as for private entities in the electricity sector. The standard reference for estimating the cost of capital for SOEs¹¹ discusses in detail the recommended method for estimating beta (the measure of systematic risk). It does not suggest that ownership *per se* should affect the systematic risk of SOEs.
177. We therefore contend that a lower regulatory risk under the proposed arrangement will have a similar impact on the cost of capital for SOEs as it will have on that for privately owned entities.
178. On the basis of these arguments, we include the three generation/retail SOEs (Genesis, Meridian, and Mighty River Power) in the asset base. Applying the same percentage risk premium as the Draft Determination, we assess benefits under the proposed arrangement of \$28-\$57m NPV (Table A4.6).
179. This Crown EGB may also raise the regulatory risk for electricity lines businesses, if those companies are prevented from passing on the cost of transmission investments forced upon them. We have not allowed for this effect in our quantification of benefits.

7.5 Dynamic efficiency

180. In the Draft Determination the Commission calculated dynamic efficiency estimates based on production cost. We argue that the market value of output is a more appropriate base. By definition, a productivity gain implies that additional output may be produced at no extra cost. Market value measures the value to the consumer of the additional output. The market value concept is applicable to the electricity market where output is measurable in unit volume terms¹². This adjustment impacts on three items in Table 3:
 - Comparative advantage of industry decision-making;
 - Strike down risk from transmission and system operator; and
 - Strike down risk from generator/retailers.

¹¹ Treasury, *Estimating the Cost of Capital for Crown Entities and State-Owned Enterprises*, A handbook prepared for Treasury, October 1997.

¹² The market value concept is not readily applicable to transmission and service provider markets as the unit of output is not measured in volumetric terms.

7.6 Balancing of benefits and detriments

181. Table 3 summarises our new estimates based on the assessments made above. The table shows the assessed benefits in the range of \$152-\$310m NPV and zero detriments.
182. Table 3 also summarises our qualitative assessment for two areas where we have assigned no estimate:
- Guiding Principles vs. GPS: Positive benefit
 - Comprehensive coverage: Neutral
183. On the basis of these assessments, we consider that the Commission should grant an authorization to the Applicant.

Table 2: Summary of new estimates			<i>LECG new</i>		
	<i>Draft Determination</i>		<i>assessment</i>		<i>Difference</i>
	<i>NPV (\$m)</i>		<i>NPV (\$m)</i>		<i>(midpoint)</i>
Public benefits under proposed arrangement					
Lower cost of capital	11	to 22	28	to 57	26
Comparative advantage of industry decision-making (Note 1)	28	to 57	45	to 90	25
Lower transaction, compliance and lobbying costs	6	to 12	6	to 12	0
Strike down risk from transmission & system operator		-	50	to 105	77
Avoidance of over-investment in transmission (Note 2)	10	to 20	10	to 20	0
Competition in transmission services (Note 3)	1	to 2	10	to 20	14
Competition in service provision	3	to 6	3	to 6	0
Total	59	to 119	152	to 310	142
Public detriments under the proposed arrangement					
Under-investment in transmission	29	to 54	-		-42
Strike-down risk from generator/ retailers (Note 4)	33	to 72	-		-53
Total	62	to 127	0	to 0	-94
Additional qualitative assessments					
GPS vs. Guiding Principles	Potentially -ve		+ve		
Comprehensive coverage	-ve		neutral		
Notes:					
1. The new assessment incorporates the "Market Value" base for dynamic efficiency, but otherwise is the same as the Draft Determination.					
2. The number shown for the Draft Determination is the amount in Table 3 of Draft Determination less the operating efficiency gains shown in that table					
3. The number shown for the Draft Determination is the operating efficiency gain shown in Table 3 of the Draft Determination					
4. Risk of strike down of pro-competitive rule changes, assessed at zero. If the Commission rejects this assessment, the methodology in Annex 3 implies a detriment					
	19	to 36	million NPV.		

Annex 1: Transmission provider/system operator incentives

Introduction

184. This Annex documents a number of statements and actions by Transpower that are consistent with the analysis in Section 3 that transmission providers and system operators have an incentive to favour uniformity and mandatory processes over diversity and decentralisation.
185. The purpose of the Annex is not to analyse the merits or otherwise of Transpower's approach to specific issues, but rather to demonstrate that the incentive effects do operate in practice and that the impacts are sufficiently wide in scope as to warrant attention by the Commission.
186. The following has two sections. The next section presents a number of Transpower statements advocating uniformity and mandatory processes. The following section presents two examples where Transpower decisions have had adverse consequences for competition in the electricity market.

Statements favouring uniform and mandatory processes

187. Transpower has been consistent in its advocacy that the rules for wholesale physical market should be mandatory on all but the very smallest generators, for example:

"It is an absolute necessity that all electricity flowing across the national grid be subject to the mandatory rules of the wholesale physical market. The reliance on voluntary contracts to ensure mandatory compliance is at best high in transaction cost." (page 25)¹³

188. Transpower has extended its argument beyond mandatory dispatch. In its submission to the Ministerial Inquiry, Transpower devoted 56 pages on why the entire wholesale trading process – from submission of bids and offers through to clearing and settlement and prudential requirements – should be mandatory on all parties:

"5.1.2 Common rules and standards

The single, compulsory governance of the wholesale physical market should be responsible for all aspects of that market including provision of quality, maintenance of security, dispatch, pricing quantity measurement, ownership reconciliation, and settlement of differences between trading arrangements. ...

¹³ Transpower New Zealand Limited, *Summary of Submission, Submission to The Ministerial Inquiry into the Electricity Industry*, 13 March 2000.

To achieve this it needs to have the mandate to set and evolve all the physical wholesale market standards and rules:

- *quality and security standards;*
- *dispatch and pricing rules that dictate security-constrained economic dispatch and the resultant physical spot price; and*
- *reconciliation rules, including metering, reconciliation, clearance and settlement against the physical spot price.” (page 36)¹⁴*

189. Transpower has made similar statements regarding Technical Standards for connected equipment.

190. MACQS provides for a 30 MW “deminimus” for compliance with the technical standards for generation stations. The rules provide that for any generation station below this deminimus, compliance would be required only if the system operator makes a successful case to the EGB. The exemption is pro-competitive because it allows small generators to avoid compliance costs that may be large relative to the value of generation output.

191. Transpower objected to the deminimus exemption as follows:¹⁵

“Mandatory arrangements:

We are concerned at proposals recommended to the GWG regarding mandatory and voluntary sections of the Rules. The SO/CQC may be at risk of not meeting the Principle Performance Objectives if the Rule Book does not create mandatory arrangements for dispatch and Common Quality. The SO/CQC would not be able to manage essential compliance of parties standing outside the EGB arrangements. The SO/CQC will recommend changes for the GWG consideration. ...

Generation deminimus:

“Over 400 MW of embedded generation below 30 MW has been identified from public sources by the SO/CQC. We are yet to identify the volume of grid-connected generation which might also be within the proposed deminimus. We believe there is an obvious case for compliance to be required for under-frequency performance for this plant.

We propose therefore making a generic case for compliance, but (sic) suggest that this should mean removal of the intended deminimus rule for frequency performance.”

Decisions that have prevented increased competition

Example 1: Introduction of CCGT generators

¹⁴ Transpower New Zealand Limited, *Submission to the Ministerial Inquiry into the Electricity Industry*, Volume 2 (Wholesale Market), 13 March 2000.

¹⁵ System Operator / Common Quality Co-ordinator, Report to the GSC meeting of 14 August 2001.

192. Attempts to introduce Combined Cycle Gas Turbine (CCGT) generation to New Zealand were first made in 1995. The CCGT technology was a substantial advance on existing gas turbines as it increased thermal efficiency from around 35% to 55%. It therefore potentially could have a substantive effect on electricity prices in the wholesale market.
193. At the time that CCGT technology became available, Transpower specified security standards through the Grid Operator Security Policy (GOSP). The relevant standard affecting CCGTs was a requirement that all generation units must be capable of remaining connected to the grid for at least one minute if frequency drops to 45Hz. CCGTs are unable to comply with this requirement.
194. During 1995 to 2001 Transpower maintained the frequency standard in GOSP unchanged rather than adopt the alternative course of purchasing compensating reserves from elsewhere (and on-charging the CCGT operator).¹⁶

Example 2: Demand-side participation

195. Demand-side participation refers to the potential for purchasers in the wholesale spot market to react to forecast prices by adjusting their load off-take. Current market rules prevent this form of participation as injection offers and off-take bids can be varied only up to 2 hours prior to dispatch (unless there is physical supply or security reason for doing so). Proposals for increased demand-side participation would allow purchasers to reduce off-take bids in response to high prices within the two-hour window. The proposal has potential to increase the competitiveness of the market while also improving system security (since a demand reduction should always be favourable to security). As noted in Annex 2, the issue has received attention since at least 1998 when Pacific Energy lodged a rule change proposal to NZEM.
196. Transpower advocates that the only valid form of demand-side participation is dispatchable demand, ie. that a purchaser could not reduce demand unless dispatched by the system operator. In March 1999, in response to a request from the MPWG, Transpower formally refused to permit a reduction in the two-hour rule (see Annex 2).

¹⁶ Further information on this issue is available on the MACQS website (www.gsp.co.nz), e.g. PB Power *The performance of large CCGT plants under non-standard frequency conditions*, Report to Frequency Standards Working Group, March 2001.

Annex 2: NZEM study¹⁷

197. This Annex studies the voting and working group processes in NZEM. The Annex is in two parts: Part A lists all resolutions lodged with NZEM since its inception and records their voting outcomes and number of days duration between lodgement and voting. Part B provides case studies of 10 areas where rule change proposals were either rejected or delayed substantially beyond normal timeframes (as provided in the NZEM rules). The case studies include several proposals that are currently being processed within NZEM.

Part A: Evidence of Voting Behaviour

198. Table A2.1 lists all resolutions lodged since NZEM began operations on 1 October 1996. To identify pro-competitive rule change proposals from anti-competitive and neutral proposals, we reviewed working group reports to the Rules Committee for assessments made at the time of the proposal. We developed narrow and wide definitions as follows:

Narrow definition of pro-competitive

199. A proposal was classified as pro-competitive if the report stated that the rule change would advance Guiding Principle 2, which reads as follows:

Guiding Principle 2: Enable the entry of new buyers and sellers

Enable the entry of new buyers and sellers on unbiased terms and, in particular, should not unfairly disadvantage new electricity supply technologies or demand-side management.

Wide definition of pro-competitive

200. A proposal was classified as pro-competitive if the report stated that the rule change would advance either Guiding Principle 2 or bullet point 2 of Guiding Principle 1:

Guiding Principle 1: Foster efficient and competitive markets

Foster markets for electricity which:

- Encourage an environment in which electricity prices are discovered through competitive interaction of buyers and sellers (bullet point 2)

¹⁷ The study does not include MARIA and MACQS. MARIA was excluded because voting by members is limited to the governing rules and does not include voting on operational rules. The MARIA Governance Board, which comprises independent members elected by the parties, makes decisions on all rule change proposals relating to the operational rules. Hence, MARIA does not provide a direct test of the strike down risk of concern to the Commission. MACQS was excluded because it has yet to establish a substantive history of voting.

201. Some working group reports did not provide an analysis of the proposal against the Guiding Principles. In these cases, which are indicated in the table by an asterisk, we have made our own assessment.

Table A2.1: NZEM Evidence on Voting Behaviour

NZEM : EVIDENCE ON VOTING BEHAVIOUR									Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote/ Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %	
???	Rules Committee Nominations	The Rules Committee will consist of: two GCMP representatives; two PCMP representatives; a TCMP representative; a person appointed by EMCO; a person appointed by the Grid Operator	N	N	1-Feb-97	6-Jun-97	125			
150399A	Small Generator Offering Rules	Enable small generators with automatic control plant to offer into NZEM based on their pre-programmed generation levels.	P	P	16-Feb-99	15/03/99	27	100	100	
150399B	Prudential Calculation Procedures		N*	N*	16-Feb-99	15/03/99	27	100	100	
280600	Must Run Dispatch Auction	The Rules Committee has agreed to put out for the vote a proposed extension of the Must Run Dispatch Auction till 31 March 2001.	N	P	31-May-00	28/06/00	28	71%	81%	
???	Notification of Intention to Withdraw Offers and Bids	To include a rule for GCMPs and PCMPs to formally notify the Scheduler of their intention to withdraw offers and bids so that the Scheduler can amend the scheduling software.	N*	N*	4-Oct-01	6/11/01	33			
180199A	Application for Voting Entitlements After 30 Nov 1998	The deletion of rule 1.7.8 from the Introductory Rules to Part 2 of the NZEM Rules. This rule states that applications for voting entitlements must be made before December 1998.	P	P	15-Dec-98	18/01/99	34	100	100	
180199B	Allow Vote Splitting	Contact Energy has proposed a rule change that allows NZEM Market Participants to split their votes across choices for elections and rule changes.	N	N	15-Dec-98	18/01/99	34	100	100	
211299	Alter Decision-making Structure for NZEM	Give the Rules Committee responsibility for all NZEM rule changes, while at the same time ensuring that ultimate decision-making power in the NZEM resides with Market Participants.	N	N*	16-Nov-99	21/12/99	35	100	100	
010699A	Clarify Reporting Obligations of Service Providers	To clarify the obligation on service providers to provide reports to Surveillance and Compliance	N	N*	20-Apr-99	1/06/99	42	100	100	
010699B	Avoid Ambiguity on Clearing & Settlement Rules	To avoid any ambiguity in the rules concerning Clearing and Settlement	N	N*	20-Apr-99	1/06/99	42	100	100	
270302	Registry Deed Extension	An extension of this deed until either 31 March 2003, the termination of the NZEM Rules, or the implementation of a new deed to enable the Registry software changes arising from the Registry Project Steering Group to be implemented	N	N	3-Feb-02	27/03/02	52	100	100	
	Average losses	Eastland Energy proposed average rather than marginal losses be used in SPD	N*	N*	3-Apr-98	29/05/98	56			

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
	Remove effect of transmission maintenance from SPD	Eastland Energy proposed that the effect of any transmission maintenance work be removed from the SPD model for pricing purposes	N*	N*	3-Apr-98	29/05/98	56		
290301	Must Run Dispatch Auction	It is proposed that the MRDA be extended for another 6 months till 30 September 2001.	N	P	30-Jan-01	29/03/01	58	100	100
260401	Recovery of EGEC Costs	A process for monthly recovery in arrears for the costs of funding the Electricity Governance Establishment Committee.	N	N	20-Feb-01	26/04/01	65	100	100
260901	Market Administration Deed Extension	Extends the fee schedules until 30 September 2002 on existing terms	N	N	20-Jul-01	26/09/01	68	100	100
021001	Extension of Must Run Dispatch Auction	Be extended to 31 March 2003 to allow synchronisation with the proposed new rules being developed under EGEC	N	P	24-Jul-01	2/10/01	70	61	73
180100	Extension of Must Run Dispatch Auction	The Clearing Manager, which will perform the role of Auctioneer for the must-run dispatch auction, should be entitled to recover its fee on a monthly basis.	N	P	1-Nov-00	18/01/01	78	70	76
300801	Hedge Settlements	To allow the Clearing Manager to consider, in setting prudential requirements, the impact of any hedge position that a PCMP might have.	P	P	10-Jun-01	30/08/01	81	69	82
240901	Publication of GXP Information	Will provide monthly aggregated quantity information to participants who have purchased electricity at a GXP and who request it.	N	N	13-Jun-01	24/09/01	103	70	82
020402	Extension of GO, SCH, DISP Deeds	For a further extension of these deeds till either 31 December 2002 or when the new arrangements become effective.	N	N	13-Dec-01	27/03/02	104	100	100
101199	Constrained on Compensation Calculation	To alter the methodology for the calculation of constrained on compensation and the ranking of offers made by block dispatch groups	N	P*	27-Jul-99	10/11/99	106	70	77
???	Redundant Rule G3.4	To eliminate the potential confusion around the rules as to the number of times the Grid Operator or Scheduler needs to provide the information described in rules 3.4.4, 3.4.5 and 3.4.6 of Section G of Part 2 of the rules.	N	N	13-Jul-00	13/11/00	123	100	100
020401	Switching Systems Development Agreement	The recovery of the Development Costs under the NZEM rules and the Switching System Development Agreement.	P	P	21-Nov-00	2/04/01	132	100	100
	Price Caps	WEL Energy proposed price caps of 10% above highest priced dispatched generator for transmission loops	N	N	7-Feb-00	20/06/00	134		
210699A	Cost Allocation Methodology for Constrained On Compensation	To make the cost allocation methodology for Constrained on Compensation more equitable	N	N*	1-Feb-99	21/06/99	140	88	100

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
210699B	Definition of Constrained On Compensation	To clarify the definition of Constrained on Compensation	N	N	1-Feb-99	21/06/99	140	88	100
210699C	Obligations of CM When Returning Securities to a PCMP Who Has Resigned	To clarify the obligations of the Clearing Manager when returning securities to a PCMP who has resigned form NZEM	N	N	1-Feb-99	21/06/99	140	88	100
210699D	Netting of Prudential Requirements for a PCMP who is also a GCMP	To allow the Prudential security requirements of an entity that is both a PCMP and a GCMP to be based on net purchases	N*	P*	1-Feb-99	21/06/99	140	88	100
180997	Fee Structure	That the existing rule 15 of section H of part 2 is deleted and a new rule 15 of section H of part 2 be inserted	P	P	1-May-97	18/09/97	140		
???	Final Pricing Minor Rule change	At its 25 July 2000 meeting, the Rules Committee agreed with the MPWG's recommended rule change proposal to replace rules 3.19 to 3.21 of section G concerning the procedure if an infeasibility arises on the second business day following dispatch.	N	N	16-Jul-00	6/12/00	143		
???	Reduced Dispatch Instructions to Clearing Manager	In order to reduce the amount of dispatch instructions received from the Dispatcher.	N	N	14-Sep-01	7/02/00	146		
050201	Block Dispatch	A proposal for a series of minor rule changes to deal with issues associated with block dispatch	N	N	1-Sep-00	5/02/01	157	100	100
191200	Half Hour Metering Estimation	Proposal that will enable Market Participants to submit estimated half-hour metering information to the Reconciliation Manager in accordance with a new rule 4.6 in MARIA	N	P	6-Jul-00	19/12/00	166	100	100
010999A	System Security Situation	To allow GCMPs and PCMPs to cancel, revise, or make new offers and bids within two hours of dispatch as a result of a system security situation or a local system security situation.	N	N	16-Mar-99	30/08/99	167	??	??
160298	Metering Information Wash-ups	To rationalise the reconciliation of revised metering information over a two-year time frame	N	N	1-Sep-97	16/02/98	168	85	100
200302	One-off Release of Bids and Offers	That NZEM bids and offers information be released for the period of May to August 2001.	P	P	1-Oct-01	20/03/02	170	100	100
200897	Clearing Structure	The separation of the Pricing Function from Clearing and Settlement. : selection and tenure of the Rules Committee and selection process for Working Groups the above resolutions and voting papers	N	N	1-Mar-97	20/08/97	172		
???	Manual price Calculation	That the methodology for calculating final prices be amended by changing the definition of a net grid injection point and a net grid exit point	N	N	16-Jun-01	6/12/01	173		

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
311000	Relevant Information	The MIWG has recommended that the rules relating to release of "relevant information" be amended to clarify:- service providers reporting requirements and to ensure the rule does not require Market Participants or service providers to breach a legal obligation or to perform an illegal act.	N	N	10-May-00	31/10/00	174	100	100
160398	Breach Reporting	To formalise Market Surveillance Committee breach reporting, investigation procedures and an informal dispute resolution process	N	N	1-Sep-97	16/03/98	196	82	21
020701	Software Change Process	To clarify the rules that pertain to software changes and auditing requirements;	N	N	13-Dec-00	4/07/01	203	100	100
050898	Metering Information	The definition of "metering information" in Annexure A be amended to ensure that the processes and procedures established by the Reconciliation Manager to reconcile embedded generation are reflected in the NZEM rules.	N	N	1-Feb-98	27/08/98	207	100	100
050898	Re-offered Generation	Re-offered generation that was temporarily unavailable due to a bona fide physical reason included in the definition of "bona fide physical reason" in Annexure A of the Rules.	N	N	1-Feb-98	27/08/98	207	100	100
050898	Time Stamps	The use of time stamps for the purposes of ranking generation should be removed from the rules of NZEM.	N	N	1-Feb-98	27/08/98	207	100	100
050898	Metering File	To alter the requirement for a single consolidated metering file per GXP to a single consolidated metering file for each retailer per GXP.	N	N	1-Feb-98	27/08/98	207	100	100
050898	Notification Period	To increase the notification period for a PCMP/GCMP to submit a bid/offer to the Reconciliation Manager from 2 to 5 days.	N	N	1-Feb-98	27/08/98	207	100	100
050898	Wash-up Amounts	To bring payment of wash-up amounts where an SMP is no longer an SMP into line with current NZEM settlement dates.	N	N	1-Feb-98	27/08/98	207	100	100
	Allocation of loss rentals	Pay loss rentals into holding account till EGB in place	N*	N*	4-Dec-01	30/06/02	208		
	Allocation of loss rentals	Consideration of allocation methodology	N*	N*	4-Dec-01	30/06/02	208		
300398	Proposed Reconciliation Manager Contract	The Rules Committee recommends that Spot Market Participants vote in favour of adopting this contract with Transpower New Zealand Limited for the provision of reconciliation services pursuant to the rules of NZEM.	N	N	1-Sep-97	30/03/98	210	100	100
170401	Electronic Dispatch	To make electronic communication the primary means of communication of dispatch instructions for generators.	N	N	22-Aug-00	27/03/01	217	100	100
171197	Addition of PCMP embedded generation failure	Broaden the definition of bona fide physical reason as it applies to Purchaser Class Market Participants to include failure of PCMP embedded generation.	N	N	1-May-97	5/12/97	218	90.00	100.00
171197	Publication of selected prices from the dispatch schedule	Publish selected prices from the dispatch schedule and reduce the period whereby Market Participants may not submit bids and offers from 4 hours to 2 hours before dispatch.	N	P*	1-May-97	5/12/97	218	100	100

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
171197	Notification of times for the commencement of preparation of each PDS	Allow notified times of commencement of preparation for each pre-dispatch schedule.	N	N	1-May-97	5/12/97	218	100	100
200701	Transpower Various Minor Rule Changes	Rule changes that Transpower has identified for inclusion in the current NZEM Rules. They fall within 3 broad categories: Formalisation of current practices. Process changes concerning communication between parties, Minor points of clarification.	N	N	13-Dec-00	20/07/01	219	100	100
	Bid and Offer Publication	Publication of Bid and Offer information	N	P	1-Sep-99	17/04/00	229		
170400	Profiling Rules	To allow Purchaser Class Market Participants (PCMPs) to submit profiled metering data into the NZEM reconciliation process.	P	P	18-Aug-99	17/04/00	243	100	100
240901	Compensation	To clarify the rules relating to the ability of the Market Surveillance Committee to order compensation to be paid where the issue is related to final pricing	N	N	20-Jan-01	24/09/01	247	100	100
080501	Non-Market Generation at \$0	To allow entry of non-market generation in the SPD model at a value of \$0	N	N	22-Aug-00	8/05/01	259	100	100
201101	Part 2 Attachments	Changes to the rules regarding the format of grid information, bid and offer information, and reserve bid and offer information that is entered in to SPD	N	N	6-Mar-01	20/11/01	259	100	100
250701	Constrained on Compensation	To clarify whether a constrained on situation exists when there is no offer for the constrained on quantity.	N	N	23-Oct-00	25/07/01	275	100	100
240701	Scheduling & Dispatch Rule Change	Changes to the scheduling and dispatch rules put forward by Transpower.	N	N	13-Oct-00	24/07/01	284	100	100
220900	Publication of Dispatch Schedule	To require the dispatcher to publish all dispatch prices and quantities on the same basis as current 11 dispatch prices	N	P*	10-Nov-99	22/09/00	317	100	100
250901	Seasonally Adjusted Profiles	Allow for extraordinary wash-ups of any months during 1999 that have already been through the 24 month NZEM wash-up when this rule becomes effective.	N	N	2-Oct-00	25/09/01	358	100	100
???	Clarification of Constrained On Compensation Calculation	To incorporate the current practice of Grid Operator constrained on/off calculation into NZEM in relation to Frequency keeping, Voltage support, and Allocation of constrained amounts between NZEM and the Grid Operator.	N	N	26-May-99	20/06/00	391		
210998	The role of the Rules Committee	That rule 5 of part 1 of the NZEM Rules be amended	N	N	1-Sep-97	30/09/98	394	100	100
210998	MSC Procedure Rules	In January 1998 the Rules Committee approved a proposal from the Market Surveillance Committee to change rule 2 of part 1 of the rules. This proposal went out to the Market for a vote on 16 February 1998. the vote itself failed.	N	N	1-Sep-97	30/09/98	394	100	100

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
210998	Day Ahead Commitment Market (DACM) Manager	At its 18 September meeting, the Rules Committee approved a recommendation from the RSWG which would see the DACM Manager being made redundant pursuant to clause 4.4 of the DACM service provider deed.	N	N	1-Sep-97	30/09/98	394	100	100
	Disallow negative prices in NZEM	Disallow negative priced offers in NZEM.	N	N	1-Apr-00	1/06/01	426		
231198	Definition of Grid Exit Point	Giving the Rules Committee the power to hear applications from Market Participants or service providers for two or more grid exit points to be treated as one grid exit point	N	N	1-Sep-97	24/11/98	449	100	100
231198	Pro rata calls on multiple securities	A methodology to allow pro rata calls on multiple securities held by the Clearing Manager in instances of PCMP default.	N	N	1-Sep-97	24/11/98	449	100	100
231198	Contracting out of the NZEM Rules	Minimise the occurrence of situations where a Market Participant may enter into a contract with a third party which would prevent it from releasing information it would otherwise be required to release under the "relevant information" regime of the NZEM rules.	N	N	1-Sep-97	24/11/98	449	100	100
141101	Disconnected Nodes at \$0	To allow a price of \$0 to be assigned to disconnected nodes	N	N	25-Jul-00	14/11/01	477	100	100
181298	Notification of Reconciliation Manager	The Reconciliation Manager would like to see the words "or as soon as possible thereafter but in any event prior to cessation" deleted from rules 6.2.3 and 6.3.3 of section H of part 2.	N	N	1-Sep-97	22/12/98	477	90	100
181298	Reduction of fees for reconciling a grid point	Rule 15.2.2 and 15.2.3 of section H of part 2 of the rules of NZEM should be amended by replacing the words "a fee of \$166.67" with "a fee of \$120.00".	N	N	1-Sep-97	22/12/98	477	90	100
181298	Publication of dispatch prices	The definition of "Dispatch Prices" in Annexure A is to be redrafted to include nine additional nodes.	N	N	1-Sep-97	22/12/98	477	90	100
301299	Must Run Dispatch Auction	As an interim measure, dispatch over the '99/2000 summer period be determined according to an auction for the right to offer must-run plant at zero-price.	N	P	1-Mar-98	30/12/99	669	70	76
	Demand-side participation	Consideration of Demand-side participation as part of real time pricing review	N	P	1-Aug-00	30/06/02	698		
280100	Final Pricing	The main focus of the rule change is to enable final prices to be published the day after trading as often as possible.	N	N	5-May-98	6/06/00	763	100	100
010502	Release of Bids and Offer Information	To release of bid and offer information publicly after a period of time. It was proposed that the information be released on an ongoing basis four weeks after the day in which those bids and offers apply.	N	P	11-Oct-99	1/05/02	933	100	100
	Bid and Offer Publication	Publication of Bid and Offer information	N	P	1-Sep-99	30/06/02	1033		
	Real Time Pricing	Use 5 minute dispatch price as final price and eliminate constrained on	N	P	26-May-99	30/06/02	1131		
	Allocation of loss rentals	Examine economic efficiency of loss rental allocation methodology	N*	N*	26-Feb-99	30/06/02	1220		

NZEM : EVIDENCE ON VOTING BEHAVIOUR								Voting Result	
Resol'n Number	Rule Change Proposal	Description	Narrow Def'n	Wide Def'n	First Lodge Date	Vote / Accept/ Reject Date	Delay (Days)	GCMP%	PCMP %
	Real Time Pricing	Fundamental review of NZEM dispatch and pricing	N	P	1-Jul-98	30/06/02	1460		
	Demand-side participation	PCMP load reductions as alternative to generator offers	N	P	6-Apr-98	30/06/02	1546		
	Allocation of loss rentals	Provide NZEM with responsibility to handle loss rental rebates	N*	N*	3-Apr-98	30/06/02	1549		
	Publication of MW deviation schedule	Publish sensitivity analysis of dispatch prices to show impact of changes in load or generation on price, intended to encourage demand side response to price	N	P	22-Oct-97	30/06/02	1712		
	Publication of reserve offer stack	Publication of reserve offer stack to enable demand-side to better respond to price signal by knowing what is driving price	N	P	22-Oct-97	30/06/02	1712		
	Bid and Offer Publication	Publication of Bid and Offer information	N	P	22-Oct-97	30/06/02	1712		

Note: " * " indicates where no working group analysis against guiding principles was available. Hence had to make own assessment.

Part B: NZEM rule changes that have been delayed or rejected

Summary

202. This annex analyses in detail all rule change proposals that were either rejected prior to coming to the vote or delayed substantially. The analysis records the key decisions made by the relevant working group, the Rules Committee, and the MSC and Transpower where relevant.
203. Table A2.2 summarises the proximate causes of rejection or delay to proposals as determined by the records on each case.

Table A2.2: Summary of delayed or rejected rule changes

Rule change proposal	Proximate cause of delay or rejection
Delayed rule changes	
Publication of bid and offer prices	<p>1st proposal</p> <ul style="list-style-type: none"> • Two reports to the MIWG gave conflicting assessments of whether the GPs would be enhanced • MSC ruled 'commercial disadvantage' <p>2nd proposal</p> <ul style="list-style-type: none"> • Split views on whether proposal would enhance GPs <p>3rd and 4th proposals</p> <ul style="list-style-type: none"> • Passed under regulatory threat from Government
Demand-side participation	<p>1st proposal</p> <ul style="list-style-type: none"> • Specific proposal added to more wide-ranging review • Transpower concerns about system security <p>2nd proposal</p> <ul style="list-style-type: none"> • Specific proposal added to RTP review • Transpower concerns about system security
Real-time pricing (RTP)	<p>1st proposal:</p> <ul style="list-style-type: none"> • Specific proposal added to more wide-range review, but the review never completed <p>2nd proposal</p> <ul style="list-style-type: none"> • Transpower concerns regarding security • The high cost of conducting the proposed trial
Allocation of loss rentals	<p>1st proposal</p> <ul style="list-style-type: none"> • Considered to be Transpower jurisdiction rather than NZEM <p>2nd proposal</p> <ul style="list-style-type: none"> • Split of views on appropriate allocation methodology
Publication of MW deviation schedule	<ul style="list-style-type: none"> • Disagreement between Transpower and working group
Publication of reserve stack/ offer curve	<p>1st proposal</p> <ul style="list-style-type: none"> • Considered to be Transpower jurisdiction rather than NZEM. <p>2nd proposal</p> <ul style="list-style-type: none"> • Disagreement between Transpower and working group

Rule change proposal	Proximate cause of delay or rejection
Rejected proposals	
Removal of Must Run Dispatch Auction	<ul style="list-style-type: none"> • MSC ruling that it would be contrary to the Guiding Principles
Introduction of price caps	<ul style="list-style-type: none"> • Proposal would breach the Guiding Principles
Average losses in SPD	<ul style="list-style-type: none"> • No clear reason given for rejecting the proposal
Maintenance outages in SPD	<ul style="list-style-type: none"> • Transpower's jurisdiction rather than NZEM

Bid and offer publication

204. Proposal in October 1997 by DSJAG¹⁸

Proposal: That market information be made available on historic Bid and Offer Data, either in submitted form or summarised (e.g. selective time periods for each of four key time intervals) and to include injection quantities by grid injection point.

Working group:

- First report to Market Information Working Group (MIWG) assessed that the proposal enhanced Guiding Principle 1 (GP1: Foster efficient and competitive markets) and this was initially accepted by MIWG.
- Second report to MIWG assessed that the proposal was contrary to GP1.
- MIWG was split on whether publication would commercially disadvantage any market participant.
- In October 1998 the MIWG sought an opinion from the Market Surveillance Committee (MSC).
- MSC considered the information would commercially disadvantage some Market Participants and was therefore confidential.
- In February 1999 the MIWG recommended to the Rules Committee that no further action be taken.

¹⁸ DSJAG is Demand Side Joint Action Group, a group comprising representatives of both NZEM purchasers and major end consumers.

Rules Committee:

- Accepted the recommendation, but stated an intention to revisit the issue after 1 April 1999 (ie. after the 3 new SOE generating companies were established under the Electricity Industry Restructuring Act 1998).

205. Proposal in September 1999 by TransAlta

Proposal: That the NZEM confidentiality rules be changed to allow publication of historic bid and offer information.

Working group:

- MIWG was split on whether the proposal advanced the guiding principles.
- MIWG recommended the proposal be put to a vote.

Rules Committee:

- Recommendation rejected in December 1999 and referred the matter back to the MIWG.

Working group:

- In April 2000 the MIWG reported a majority recommendation that the rule change was neutral with respect to the guiding principles.

Rules Committee:

- Rejected the proposal by majority vote.
- The generator representatives voted for rejection while the purchaser and service provider representatives voted in favour of putting to a vote.

206. Proposal in October 2001 by Meridian Energy

Proposal: Release of all NZEM Bid and Offer information for the 1 May 2001 to 31 August 2001 period.

Rules Committee:

- Market Pricing Working Group (MPWG) recommended release of information from 1 January 2001 to 31 August 2001.

Rules Committee:

- Accepted recommendation.
- Vote held March 2002 with majority achieved in both GCMP and PCMP classes.

207. Proposal by MPWG

Proposals:

- To put a rule change for the release of bid and offer information, subject to a four week delay, to the vote of Market Participants.
- To seek Commerce Commission authorisation to reduce the four-week delay to a two-week delay.

Working group:

- MPWG recommended the first part of the proposal be accepted.
- MPWG noted that issues of possible anti-competitive behaviour arose for release less than 4 weeks.
- Recommended an application to the Commerce Commission for reduction from 4 week to 2 week delay.

Rules Committee:

- Accepted the recommendations.
- Vote held May 2002 with majority achieved in both GCMP and PCMP classes
- Application to Commerce Commission currently being prepared for reduction of delay from 4 weeks to 2 weeks.

208. LECG comments

Over four years elapsed from the time of the first proposal to the recent votes held on the 3rd and 4th proposals. Particularly relevant to this case are the two reports to the MIWG giving conflicting assessments of whether the GPs would be enhanced and also the MSC ruling that release of bid and offer data was likely to commercially disadvantage a market participant. In contrast, the recent votes to adopt publication appear to have been influenced by strong threat of regulation by the Government.

Demand-side Participation

209. Proposal in April 1998 by Pacific Energy (an energy trader)

Proposal: To allow demand offers to reduce load to be treated equivalent to generator offers to increase output.

Rules Committee:

- Asked MPWG to treat the proposal as part of a general review dispatch and pricing (implying a longer timeframe than normal for consideration of this proposal).

Working group:

- In January 1999 MPWG agreed that allowing a reduction in the 2 hour bidding and offering gate closure rule would be equivalent to the proposal.
- Asked Transpower to look at the security implications of the equivalent proposal.

Transpower:

- Advised in March 1999 that the security implications of the proposal were complicated and that it would not permit the proposed change at this point in time.
- Suggested that the issue be re-examined in 12 months time.

Working group:

- Decided to defer further discussion on the 2 hour rule until next meeting.
- No further discussions are on record.

210. Proposal in June 2000 by Rules Committee

Proposal: That the MPWG make development of a real time market, including demand-side participation, a priority for the coming year.

Working group:

- MPWG established the demand-side participation subgroup to consider the proposal.
- DSP subgroup recommended to MPWG in October 2000 that demand side participants be allowed to self dispatch in response to price signals.
- MPWG members disagreed over the security implications of the recommendation but put the recommendation to the Rules Committee in November 2000.

Transpower:

- Expressed strong reservations on security, in particular the impact of demand side participation on Transpower's ability to undertake the security analysis within the 2 hour window of dispatch.

Rules Committee:

- Noted the recommendation but considered demand-side participation would be best enhanced by Real Time Pricing (RTP).
- Referred the proposal back to the MPWG with instruction to include it in a wider study of RTP.
- The RTP study has yet to reach a conclusion.

211. LECG comments:

The delays in putting the proposal to vote have arisen from two sources. First, the Rules Committee has considered that the specific proposals need to be assessed in the context of more wide-ranging reviews of how the market operates and late in the process switched issue to one concerning real time pricing. This has necessarily extended the time required to process the proposals. Second, Transpower has expressed concerns about the implications for system security, stating that it was prepared to exercise its veto to prevent the proposal being adopted.

Real Time Pricing212. Proposal in July 1998 by the Rules Committee

Proposal: To investigate ways of improving the timeliness, simplicity, transparency and overall quality of prices.

Working group:

- MPWG began a review of how well the dispatch and pricing processes lined up and whether a more frequent pricing interval would be more appropriate.
- The review was never completed, but it is not clear from the records why this occurred.

213. Proposal in May 1999 by Contact Energy

Proposals:

- That the dispatch stack be re-run every five minutes giving a trading period price based on the average of the six, five minute prices.
- That the rules that presently determine prices based on the offer stack at the commencement of the trading period be replaced by having the highest priced generator running during the five minute period setting the price for those five minutes.
- If the above rule changes are made, that the constrained on compensation mechanism is then removed from the NZEM Rules.
- The NZEM Rules incorporate a mechanism for determining an availability price for fast start/synchronised plant at times of system stress.

Working group:

- MPWG initiated the Real Time Pricing (RTP) program.
- Over the following year to June 2000 a range of issues and permutations associated with RTP were reviewed.
- Considered proposal from Transpower to introduce Read Time Dispatch (RTD) into NZEM, initially seen as an essential precursor to RTP.

- After reviewing a range of issues and permutations over 12 months, MPWG concluded that RTD would not, of itself, allow easy introduction of RTP.

Rules Committee:

- Requested in June 2000 (following the Ministerial inquiry) the MPWG to combine demand side participation and real-time pricing and make it the top priority.

Working group:

- MPWG formed the subgroup to consider both issues and contracted a project manager.
- The subgroup progress report in November 2000 proposed a trial be undertaken.

Transpower:

- Expressed concern about the resource implications of implementing the proposed trial in the timetable.
- Expressed concern about security issues associated demand side response to prices and the liability issues associated with Transpower being involved in demand forecasting.
- Provided an alternative proposal.

Working group:

- A compromise reached with a report to the Rules Committee in December 2000 recommending to proceed with a trial.

Rules Committee:

- Questioned the cost/benefits and requested further information to justify the trial.

Working group:

- MPWG reported back to Rules Committee in June 2001 with a cost/benefit analysis of RTP and demand-side participation (but not of the trial itself).

Transpower:

- Questioned the benefits of the proposed approach and suggested an alternative approach.

Rules Committee:

- Sought confirmation from MPWG in September 2001 that the trial included demand side participation, demand bidding, and a review of the 2 hour rule.

Transpower:

- Cost of trial estimated at \$2.4 Million as Transpower considered a large amount of infrastructure rebuilding of their SPD system would be required to support the proposed trial.
- In April 2002, Transpower and RTP project manager produced a revised trial scope with a reduced cost of approximately \$700,000.

Rules Committee:

- Approved at May 2002 meeting a resolution to proceed with the final trial proposal.

214. LECG comment

The original review began in July 1998 did not reach a conclusion for reasons that are not clear from incomplete records. Notably, the issue was re-ignited by a major vertically-integrated generator/retailer, Contact Energy. It was incorporated into a wider review that went to the fundamentals of market operations. Issues raised by Transpower regarding security and the initially high cost of conducting the proposed trial have slowed progress.

Allocation of Loss Rentals

215. Proposal in April 1998 by Eastland Energy

Proposal:

- That NZEM be allocated the responsibility to handle loss rentals.
- Losses to be based on average rather than marginal losses.
- The effects of any transmission constraints caused by Transpower's maintenance to be removed from SPD.

Working group:

- MPWG concluded that the proposal was outside the scope of NZEM and recommended it be referred to Transpower

Rules Committee:

- Accepted the recommendation in August 1998.

216. Proposal in February 1999 by Pacific Energy

Proposal: A change to Rules 11.4.3 and 16.1 of Section H of Part II of the NZEM Rules to enable the Grid Owner to be paid for actual losses with any surpluses refunded to Spot Market Participants (ie. energy traders).

Working group:

- MPWG were unable to agree on a suitable alternative allocation methodology.

- MPWG recommended in September 1999 the proposal be rejected.
- No guiding principles analysis was provided with the recommendation.

Rules Committee:

- Did not accept the recommendation
- Referred the issue back to the MPWG with clarified terms of reference

Working group:

- MPWG established a subgroup in May 2000.
- The subgroup was also unable to reach a consensus on what possible option represented an advancement on the status quo.
- MPWG recommended in March 2001 that the issue be referred to the incoming EGB.

Rules Committee:

- Accepted the recommendation.

217. Two proposals in December 2001

Proposals:

- By Mighty River Power, that loss and constraint rentals be put in a stakeholder account until the EGB is in place.
- By TrustPower, that allocation methodology be reconsidered.

Rules Committee:

- Formed a new working group, the Loss and Constraint Allocation Working Group (LCAWG)

Working group:

- As at May 2002, LCAWG is giving consideration to the proposals

218. LECG comments

A key factor in this case appears to be that NZEM does not have full jurisdiction over loss and constraint rental issues, as Transpower and the lines companies are central to the issue. This is an area where the merging of governance structures under the proposed arrangement should provide a better framework for resolution.

Publication of MW Deviation Schedule

219. Proposal in July 2000 by Transpower

Proposal: Publication of a MW deviation schedule. It was intended as a measure to encourage demand-side participation by allowing parties to see the effect of changes in load, or generation, on the price.

Working group:

- MIWG concluded the proposal advanced Guiding Principle 1.
- MIWG reviewed the options for publication of the schedule and how many deviations should be allowed for.
- Discussion with Transpower as to the optimum trade off between costs of providing different deviation schedules and the number of schedules to be provided.
- Formal comments sought from Transpower in March 2001.
- No response received from Transpower by December 2001.

Rules Committee:

- Considered options for moving proposal forward in December 2001
- Referred issue to MPWG and closed down the MIWG.

Working group:

- MPWG recommended in May 2002 that the information sought was better provided by transmission constraint information provided near to real time.

Rules Committee:

- Accepted recommendation

220. LECG comments

The proposal appears to have stalled for a lengthy period through a difference of opinion between NZEM and Transpower.

Publication of Reserve Stack/Offer Curve

221. Proposal in October 1997 by DSJAG

Proposal: That the reserve offer stack be published.

Working group:

- MIWG received terms of reference from Rules Committee in May 1998.
- MIWG concluded in July 1998 that the reserve market is a Transpower issue.
- Recommended that Transpower be requested to make the information available on TPIX (Transpower's information system).

Rules Committee:

- Accepted the recommendation and wrote to Transpower in November 1998 requesting they make reserve stack information available on TPIX.

Working group:

- Concluded in August 2001 that the proposal advanced Guiding Principle 1.
- MIWG continued to liaise with Transpower regarding implementation time and costs, but not able to agree.

Rules Committee:

- In December 2001 noted that the issue had not been resolved.
- Referred proposal to MPWG and closed down the MIWG.

222. LECG comments

NZEM and Transpower have disagreed on the best technical option for implementing this proposal. Jurisdiction over the issue appears to rest with Transpower rather than NZEM.

Negative Prices

223. Proposal pre-March 1998 by Generators

Proposal: That a method of dealing with negatively priced offers needed to be implemented in SPD.¹⁹

Working group:

- Zero-Price Working Group assessed that a “Must Run Dispatch Auction” would enhance Guiding Principle 1.
- Recommended the “Must Run Dispatch Auction” to Rules Committee.

Rules Committee:

- Accepted the recommendation in November 1999

¹⁹ For some generators the cost of shutting down can be very high, e.g. geothermal stations can be damaged by shut down and re-start while some hydro systems are forced to generate to maintain lake levels within resource consents. Under the Resource Management Act, Board directors are personally liable for breach of such consents. On some days, e.g. Christmas Day, power demand can fall below the minimum supply from these stations. In the circumstances, some generators might rather pay to remain operating rather than close down. Although NZEM rules provide for the clearing price to be negative, the Scheduling, Pricing and Dispatch (SPD) software implemented by Transpower is unable to solve with negative offer prices.

- Vote was achieved with majority of GCMPs and PCMPs

Market Surveillance Committee:

- Contact Energy appealed to the MSC
- MSC found that the original MRDA rule change was in accordance with the guiding principles in that it was a default way of achieving the outcome desired from negative prices.

224. Proposal in December 1999 by Contact Energy

Proposal: Modify rule 2.12 of Section B of part 2 of NZEM to the effect that prices below \$0/MHhr not be accepted.

Rules Committee:

- Based on the MSC ruling, the Rules Committee rejected the proposal as being contrary to the Guiding Principles.

Price Caps

225. Proposal in February 2000 by WEL Energy

Proposal: To allow prices to be capped in NZEM, at the highest priced optimally dispatch generator plus a margin, when transmission loops have binding constraints. WEWL proposed dispatchable demand as a long term solution.

Working group:

- MPWG considered the proposal breached guiding principle 1 and recommended rejection.

Rules Committee:

- Accepted the recommendation on 20 June 2000
- Rule change proposal was rejected

Average Losses in SPD

226. Proposal in April 1998 by Eastland Energy

Proposal: That the calculation for grid losses in NZEM be based on average rather than marginal losses.

Working group:

- MPWG recommended the proposal be rejected.
- The records do not state clearly the reason for rejection.

Rules Committee:

- Accepted recommendation.²⁰

Maintenance Outages in SPD

227. Proposal in April 1998 by Eastland Energy

Proposal: That the effects of any transmission constraints caused by Transpower's maintenance be removed from the SPD model.

Working group:

- MPWG considered the proposal to be a Transpower issue
- Recommended in May 1998 that the proposal be rejected

Transpower:

- Accepted recommendation.²¹

²⁰ The MPWG report of August 1998 notes that the Rules Committee accepted its recommendation. However the minutes for the particular meeting where the recommendation was accepted has not been located.

²¹ Ibid previous footnote.

Annex 3: "Wait and see" assessment

228. This annex outlines a framework for assessing the benefits and detriments arising from the risk of strike down of rule change proposals. The framework is intended for the situation where the Commission believes, contrary to our assessment, that the risk of strike down is material.

229. The framework covers both sources of risk, from generator/retailers and transmission provider/system operator. It also incorporates alternative assumptions about whether the Minister takes a strong or weak stance on competition issues. The issue arises from the Commission's comment (para. 239) the potential for government action:

Any pattern of existing market participants consistently voting down rule changes which the Industry EGB considers are pro-competitive and desirable would be readily apparent and might lead to Government intervention. This may provide some disincentive to market participants considering use of their voting power to veto pro-competitive rule changes (para. 239).

230. The assumption about the Minister's stance on competition issue is relevant to the Commission's authorization decision. Because the proposed arrangement would not prevent regulatory intervention at a later date, and because the propensity for strike down is highly uncertain, it makes sense for the Commission to authorise the proposed arrangement so that it becomes possible to observe whether a problem does exist under the new arrangement. If it does, the government can readily take action to improve the situation.

231. Incorporating these factors means that the potential for strike-down of pro-competitive rules relies on four propositions:

- The initial rules that would be adopted by either a Crown EGB or Industry EGB have some room for improvement, ie. there are as yet unidentified opportunities for lowering entry barriers, or improving market efficiency; and
 - The major vertically integrated generators have an incentive to strike-down rules that would improve competition;
- or*
- The transmission provider and system operator have an incentive to strike down rules that would improve competition; and
 - The Minister would take a weak stance on competition issues.

The Draft Determination (para 436) identified only the first two propositions.

232. Table A3.1 characterises the alternative scenarios where the risk of strike down could come from either incumbent generator/retailers or the transmission provider/system operator and where the Minister could be either strong or weak on competition issues. The four panels summarise the competitive consequences of the proposed arrangement and counterfactual in each situation.

Table A3.1: Risks to pro-competitive rule changes

Source of risk	Minister is strong on competition issues	Minister is weak on competition issues
Strike down by generator/retailers	<u>Panel A</u>	<u>Panel D</u>
Proposed arrangement	Regulatory action after maximum delay of 2 years if voters strike down pro-competitive rule changes	Voters adopt pro-competitive rule changes without delay
Counterfactual	Minister adopts pro-competitive rules without delay	Minister persuaded by lobbying to reject pro-competitive rule changes
Strike down by transmission provider/system operator	<u>Panel B</u>	<u>Panel C</u>
Proposed arrangement	Voters adopt pro-competitive rule changes without delay	No regulatory action, voters may strike down rule changes indefinitely
Counterfactual	Minister seeks to adopt pro-competitive rule changes but is stymied by transmission provider/system operator	Minister persuaded by lobbying to reject pro-competitive rule changes

Panel A

233. In Panel A there is a significant risk that generator/retailers have an incentive to strike down pro-competitive rule changes but this is countered by a Minister who is strong on competition issues. In this scenario, the Minister would take regulatory action under the proposed arrangement to restore competitive pressures if strike down occurred consistently during the Minister's term of office. This suggests a delay of 18 months - 2 years maximum before action would be taken. Under the counterfactual the Minister is the decision-maker and would adopt pro-competitive rules recommended by the Crown EGB.
234. Therefore, if the Commission authorised the proposed arrangement the potential detriment would be a loss of competitive pressures for a maximum of two years.
235. To be conservative in our assessment, we assume that generator/retailer voters would not capitulate to the regulatory threat and would vote down pro-competitive rule changes consistently until the Minister intervened by regulation. We also assume that once the Minister has intervened it would take a further 10 years for productivity levels to catch up to levels under the counterfactual. On this basis, the detriment under the proposed arrangement is assessed to be \$19-\$36m.

Panel B

236. In Panel B the main risk to pro-competitive rule changes arises from the incentives of the transmission provider and system operator to favour uniformity over diversity and differentiation. Under the proposed arrangement, the decision rights are held by industry participants, who are well-informed through their direct involvement and have incentives to adopt pro-competitive rule changes.²²
237. Under the counterfactual, the Minister seeks to adopt pro-competitive rule changes but is less well informed than industry participants and is reluctant to act against the advice of the transmission provider/system operator as experts in system security. The political risks are too great even though the Minister supports competition.
238. We assess a benefit for the proposed arrangement relative to the counterfactual. We assess that the competitive effects would be similar to those estimated in the Draft Determination for pro-competitive strike down (but opposite in sign)²³. For Panel B we adopt the lower end of the range (after adjusting the calculation of dynamic efficiency), amounting to \$45m.

Panel C

239. Panel C is the same as Panel B except the Minister is weak on competition. The proposed arrangement is superior to the counterfactual because the voting members are well informed and have incentives to improve the efficiency of their operations. Under the counterfactual, the transmission provider/system operator find it relatively easy to persuade the Minister that pro-competitive rule changes would jeopardise system security.
240. We assess a benefit under the proposed arrangement equal in magnitude to the high end of the pro-competitive detriment assessed in the Draft Determination²⁴. This amounts to \$90m.

²² This is particularly true for trading rules (Part G) where neither the system operator or transmission provider has voting rights. It would apply to common quality (Part C) if all members voted against the transmission provider and also to substitute services for transmission (Part F) where the incumbent transmission provider would normally be allocated few votes.

²³ The estimate of dynamic efficiency in the Draft Determination (Table 6) uses production cost as base. Later in this section, we argue that market value of output is a more appropriate base. The estimate used here incorporates the new base but leaves all other assumptions unchanged.

²⁴ After adjusting the calculation of dynamic efficiency as noted in the previous footnote.

Panel D

241. In Panel D the main risk to pro-competitive rule changes arise from generator/retailers. The Minister is assumed to take a weak stance on competition issues. The proposed arrangement and counterfactual have similar competitive consequences as under both cases lobbying activity is largely successful in forestalling action by the Minister. The proposed arrangement is competitively neutral relative to the counterfactual. The assessed detriment is zero.

Summary

242. The framework developed in this annex is consistent with the Commission adopting a “wait and see” policy with regard to strike down of pro-competitive rule changes. Because the proposed arrangement would not prevent regulatory intervention at a later date, and because the propensity for strike down is highly uncertain, it makes sense for the Commission to authorise the proposed arrangement so that it becomes possible to observe whether a problem does exist under the new arrangement. If it does, the government can readily take action to improve the situation. Alternatively, if the Commission declines the authorisation, the risk is that pro-competitive rule changes are thwarted by the transmission provider and system operator and that reversing out of the Crown EGB model would be much more difficult and potentially could be delayed indefinitely.

Annex 4: Quantification of benefits and detriments

Risk to pro-competitive rule changes – Panel A of Table A3.1

- Structure and assumptions same as in Draft Determination
- Effects of delayed investment are the same as in the Draft Determination.
- For allocation and production efficiency (Tables A1 and A2) the impact of regulatory action under a Minister strong on competition is lower efficiency in years 1-2 but zero loss thereafter.

Table A4.1: Competition in the electricity market - allocation

<i>Parameter</i>	<i>Units</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Year 6</i>	<i>Year 7</i>	<i>Year 8</i>	<i>Year 9</i>	<i>Year 10</i>
Average price under strong	\$/ MWh	50	50	50	50	50	50	50	50	50	50
Average quantity under strong	GWh	36,750	37,412	38,085	38,770	39,468	40,179	40,902	41,638	42,388	43,151
Price elasticity of demand		- 1.20	- 1.20	- 1.20	- 1.20	- 1.20	- 1.20	- 1.20	- 1.20	- 1.20	- 1.20
Price elasticity of supply		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Mark up on price under weaker competition	%	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
Average quantity under weaker competition	GWh	36,530	36,963	37,399	37,840	38,284	38,732	39,184	39,640	40,099	40,562
Marginal cost at new	\$/ MWh	49.4	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
DWL from higher price under weaker competition	\$m/ yr	0.1	0.1	0.3	0.5	0.7	1.1	1.5	2.0	2.6	3.2
DWL with regulatory action in year 3	\$m/ yr	0.1	0.1	-	-	-	-	-	-	-	-
NPV	\$m										0.2
Mark up on price under weak competition	%	1	2	3	4	5	6	7	8	9	10
Average quantity under weak competition	GWh	36,309	36,514	36,714	36,909	37,100	37,286	37,466	37,641	37,810	37,973
Marginal cost at new quantity	\$/ MWh	48.8	49.4	49.9	50.0	50.0	50.0	50.0	50.0	50.0	50.0
DWL from higher price under weak competition	\$m/ yr	0.4	0.7	1.1	1.9	3.0	4.3	6.0	8.0	10.3	12.9
DWL with regulatory action in year 3	\$m/ yr	0.4	0.7	-	-	-	-	-	-	-	-
NPV	\$m										1.0

Table A4.2: Reduced competition in the electricity market - production efficiency

<i>Parameters</i>	<i>Units</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Year 6</i>	<i>Year 7</i>	<i>Year 8</i>	<i>Year 9</i>	<i>Year 10</i>
Generation cost under proposal (low)	\$m/ yr	758	780	801	824	846	868	891	913	936	960
Efficiency losses under weaker competition	%	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
Value loss under weaker competition	\$m/ yr	0.4	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.2	4.8
Value loss with regulatory action in year 3 (low)	\$m/ yr	0.4	0.8	-	-	-	-	-	-	-	-
NPV (low)	\$m										1.0
Generation cost under proposal (high)	\$m/ yr	753	764	774	783	793	802	811	820	828	837
Efficiency loss under weaker competition (high)	%	0.1	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Value loss under weaker competition (high)	\$m/ yr	0.8	1.5	2.3	3.1	4.0	4.8	5.7	6.6	7.5	8.4
Value loss with regulatory action in year 3 (high)	\$m/ yr	0.8	1.5	-	-	-	-	-	-	-	-
NPV (high)	\$m										1.9

For dynamic efficiency (Table A4.3) the impact of regulatory action in year 2 is to reverse the deterioration in lower productivity level under the proposed arrangement (relative to counterfactual). From year 3 onwards, the productivity level begins to converge to the counterfactual productivity level, reaching parity after 10 years (ie. by year 12). NPV is calculated over 10 years.

Table A4.3: Competition in electricity market - dynamic efficiency

<i>Parameters</i>	<i>Units</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
Volume of output (low mark up)	GWh	36,530	36,963	37,399	37,840	38,284	38,732	39,184	39,640	40,099	40,562
Productivity gain under counterfactual	%	1.00	2.01	3.03	4.06	5.10	6.15	7.21	8.29	9.37	10.46
Productivity under proposal with regulatory action (low)	%	0.95	1.91	2.89	3.90	4.92	5.96	7.03	8.11	9.22	10.35
Difference in productivity level (low)	%	0.05	0.10	0.14	0.16	0.18	0.19	0.19	0.17	0.15	0.11
Difference in output (low)	GWh	18.3	37.3	51.5	62.3	69.6	73.2	72.7	67.9	58.5	44.3
Average market price (wholesale market)	\$/ MWh	50	50	50	50	50	50	50	50	50	50
Dynamic efficiency loss with regulatory action (low)	\$m	0.9	1.9	2.6	3.1	3.5	3.7	3.6	3.4	2.9	2.2
NPV (low)	\$m										16.2
Volume of output (high mark up)	GWh	36,309	36,514	36,714	36,909	37,100	37,286	37,466	37,641	37,810	37,973
Productivity gain under counterfactual	%	1.00	2.01	3.03	4.06	5.10	6.15	7.21	8.29	9.37	10.46
Productivity under proposal with regulatory action (high)	%	0.90	1.81	2.75	3.73	4.74	5.77	6.84	7.94	9.08	10.24
Difference in productivity level (high)	%	0.10	0.20	0.28	0.33	0.36	0.38	0.37	0.34	0.29	0.22
Difference in output (high)	GWh	36.3	73.7	101.0	121.5	134.9	140.7	138.8	128.7	110.1	82.7
Dynamic efficiency loss with regulatory action (high)	\$m	1.8	3.7	5.1	6.1	6.7	7.0	6.9	6.4	5.5	4.1
NPV (high)	\$m										31.3

Risk to pro-competitive rule changes – Panels C and B of Table X

- The following is table from page 121 of the Draft Determination adjusted to value productivity gains at market value rather than production cost.
- Allocation, production and delayed investment tables (pages 119-120) are the same as in the Draft Determination

Table A4.4: Competition in electricity market - dynamic efficiency at market value

<i>Parameters</i>	<i>Units</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
Volume of output (low mark up)	GWh	36530	36963	37399	37840	38284	38732	39184	39640	40099	40561.6
Productivity gain under counterfactual	%	1.00	2.01	3.03	4.06	5.10	6.15	7.21	8.29	9.37	10.46
Productiveity gaint under proposal (low)	%	0.95	1.91	2.88	3.85	4.84	5.84	6.84	7.86	8.88	9.92
Difference in productivity level (low)	%	0.05	0.10	0.15	0.21	0.26	0.31	0.37	0.43	0.49	0.55
Difference in output level (low)	GWh	18.3	37.3	57.2	77.9	99.5	122.0	145.4	169.7	195.0	221.3
Average market price (wholesale market)	\$/ MWh	50	50	50	50	50	50	50	50	50	50
Dynamic efficiency loss (low)	\$m	0.9	1.9	2.9	3.9	5.0	6.1	7.3	8.5	9.8	11.1
NPV (low)	\$m										29.8
Volume of output (high mark up)	GWh	36309	36514	36714	36909	37100	37286	37466	37641	37810	37972.6
Productivity gain under counterfactual	%	1.00	2.01	3.03	4.06	5.10	6.15	7.21	8.29	9.37	10.46
Productivity gain under proposal (high)	%	0.90	1.81	2.72	3.65	4.58	5.52	6.47	7.43	8.40	9.37
Difference in productivity level (high)	%	0.10	0.20	0.31	0.41	0.52	0.63	0.74	0.85	0.97	1.09
Difference in output level (high)	GWh	36.3	73.7	112.2	151.9	192.7	234.5	277.6	321.7	367.0	413.5
Dynamic efficiency loss (high)	\$m	1.8	3.7	5.6	7.6	9.6	11.7	13.9	16.1	18.4	20.7
NPV (high)	\$m										57.1

Competition in the transmission market

Table A4.5: Transmission costs - operating efficiency

<i>Parameters</i>	<i>Units</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Year 6</i>	<i>Year 7</i>	<i>Year 8</i>	<i>Year 9</i>	<i>Year 10</i>
Current annual transmission costs	\$m	440	440	440	440	440	440	440	440	440	440
Operating costs as percent of total costs	%	32	32	32	32	32	32	32	32	32	32
Operating efficiency under proposed arrangements (low)	%	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5
Reduction in operating costs	\$m	0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	3.5
NPV (low)	\$m										10.2
Operating efficiency under proposed arrangements (high)	%	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Reduction in operating costs	\$m	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0
NPV (high)	\$m										20.4

Cost of capital

- New estimate reflecting the inclusion of SOE generator/retailer companies.

Table A4.6: Regulatory risk and cost of capital

<i>Parameters</i>	<i>Units</i>
Asset value	
- Generation & retail	\$b 9.2
- Transmission	\$b 0.0
- Distribution	\$b 0.0
Total annual gain (low = 5bp)	\$m 4.6
Total annual gain (high = 10bp)	\$m 9.2
NPV gain under the proposal (low)	\$m 28.3
NPV gain under the proposal (high)	\$m 56.5

Dynamic efficiency calculations

- New estimate based on market value of output rather than production cost.

Table A4.7: Dynamic efficiency - electricity generation

<i>Parameter</i>	<i>Units</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
Volume of	GWh	36,750	37,412	38,085	38,770	39,468	40,179	40,902	41,638	42,388	43,151
Productivity gain under	%	1.00	2.01	3.03	4.06	5.10	6.15	7.21	8.29	9.37	10.46
Productivity gain under counterfactual	%	0.95	1.91	2.88	3.85	4.84	5.84	6.84	7.86	8.88	9.92
Difference in productivity level	%	0.05	0.10	0.15	0.21	0.26	0.31	0.37	0.43	0.49	0.55
Difference in output	GWh	18.4	37.8	58.2	79.8	102.6	126.5	151.7	178.3	206.1	235.4
Average market price (wholesale)	\$/ MWh	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Dynamic efficiency gain	\$m	0.9	1.9	2.9	4.0	5.1	6.3	7.6	8.9	10.3	11.8
NPV	\$m										31.0
Productivity gain under proposal	%	0.90	1.81	2.72	3.65	4.58	5.52	6.47	7.43	8.40	9.37
Difference in productivity level	%	0.10	0.20	0.31	0.41	0.52	0.63	0.74	0.85	0.97	1.09
Difference in output	GWh	36.8	75.5	116.4	159.5	204.9	252.7	303.0	355.9	411.5	469.8
Dynamic efficiency loss	\$m	1.8	3.8	5.8	8.0	10.2	12.6	15.2	17.8	20.6	23.5
NPV	\$m										62.0

Note: Production efficiency gain same as Draft Determination