



ELECTRICITY COMMISSION

Explanatory Paper

Grid Investment Test

3 December 2004

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PURPOSE

1. The purpose of this paper is to:
 - a. present a summary of submissions received on the draft grid investment test, recently released for consultation; and
 - b. provide explanatory information for participants and submitters to accompany the publication of the Electricity Commission's final recommendation to the Minister of Energy (Minister) in response to those submissions.

RECOMMENDATION FRAMEWORK

2. Rule 6.6 of section III of part F of the Electricity Governance Rules ("the Rules") requires the Electricity Commission ("the Commission") to recommend to the Minister, for inclusion as a schedule to section III of part F of the Rules, the grid investment test ("the GIT").
3. This is the recommendation by the Commission of the GIT required by rule 6.6.
4. Rule 6 of section III of part F requires the Board to determine the most appropriate GIT.
5. The Commission engaged Frontier Economics to prepare a paper on the draft GIT, which was published on the Commission's website in August 2004. The Commission received advice from the Transmission Advisory Group (TAG) and the Transmission Pricing Advisory Group (TPAG) and revised components of the GIT provided by Frontier Economics.
6. The Commission is required to publish a draft of the GIT, consider submissions, and recommend an appropriate GIT to the Minister by 17 December 2004.
7. The Commission released a consultation paper, with draft rules, on 24 September 2004. Consultation closed on 29 October 2004, with 21 submissions received from interested parties.
8. The GIT is a key element of part F of the EGRs, and of section III of part F in particular.
9. Part F provides a framework for key aspects of the provision of transmission services by Transpower, including processes for the approval of grid upgrades and investments, and a procedure to ensure the payment to Transpower by designated transmission customers of costs and charges, calculated according to an approved methodology, in respect of transmission services.
10. Elements of part F (see, for example, Rules 2.1, 9.1.2, 10.2.2 and 13.3.1.2) reflect the long-term nature of grid investment and the need for grid

investment decisions to be made in a timely manner. The Government Policy Statement (“the GPS”) also emphasises the strategic nature of grid investment and the need for the Commission to award a high priority to implementing part F in recognition of that fact (see, for example, paragraphs 86(iii), 96 and 122).

11. The Commission has, in making this recommendation, been particularly mindful of those considerations.
12. At the same time, part F, the Commission’s principal objective and its GPS objectives, all emphasise the importance of the efficient provision of transmission. This is a specific focus of part F. Efficiency as an objective for transmission investment is reflected in the GPS (paragraphs 80, 86(ii) and 94). Efficiency in transmission is also a contributor to the achievement of the Commission’s overall objective of ensuring that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable and environmentally sustainable manner (s 172N(1)), and to the achievement of the Commission’s specific outcomes (s 172N(2)).
13. The Electricity Commission is also mindful of its objective to promote and facilitate the efficient use of electricity.
14. The Commission observed recently in its Statement of Intent:
 - “The principal objectives, set out in section 172N of the Act, are a challenge for the Commission, as the objectives contain multiple priorities which need to be considered each time a decision is made.
 - The Commission considers the appropriate weight to apply to each objective should be specific to each decision, whether it is of a regulatory, policy or work prioritisation nature.”
15. In that Statement of Intent, the Commission also acknowledged the strategic priority it had of working with Transpower and grid users to facilitate priority investment in the grid.
16. The Commission has approached its task of making this recommendation in this overall framework, recognising the specific focus and objectives of part F itself and the need to balance the various elements of its principal objectives and specific outcomes.

The Scheme of Part F

17. Implementation of the part F scheme by the Commission involves the development of a number of separate but inter-related components. These include:
18. The development of grid reliability standards and grid planning assumptions, to provide a framework within which the performance of the power system can be assessed and to enable the Commission, in turn, to publish statements of opportunities. The statements of opportunities are a key part F document, as they identify opportunities for investments in transmission or transmission alternatives.

19. Statements of opportunities, in turn, provide the basis for the preparation by Transpower of grid upgrade plans. It is through the submission of grid upgrade plans that Transpower may obtain Commission approval for transmission investments.
20. The function of the GIT is, in turn, to form a key component of the process whereby the Commission approves transmission investments proposed by Transpower in grid upgrade plans.
21. It is for this reason that the Commission, in order to meet the GPS timetable which calls for the approval of an initial grid upgrade plan by September 2005, identified the recommendation of the GIT as an early task.

The GIT Objectives

22. Rule 6.3 provides a set of objectives to which the Commission must have regard in developing the GIT:
 - 6.3.1 Promoting economic efficiency (including energy efficiency) in transmission and the wholesale market;
 - 6.3.2 As far as practicable reflecting the interests of end use customers in ensuring a reliable transmission system having regard to the cost to end use customers;
 - 6.3.3 Reflect a reasonable economic assessment of the balance between different levels of reliability and the expected value of energy at risk;
 - 6.3.4 Enabling selection of transmission upgrade options that maximise the total net benefits to those who produce, distribute and consume electricity after taking into account transmission alternatives;
 - 6.3.5 Promoting certainty for investment in transmission, generation and transmission alternatives and investment contracts; and
 - 6.3.6 Facilitating outcomes acceptable to Transpower and designated transmission customers.
23. These objectives are to be seen in the context of the functions of the GIT as described in rule 6.2, and the purposes of section III as described in rule 2.
24. The Electricity Commission elaborates on its understanding of this framework, and the reasons for the GIT it is proposing, in more detail in the section of the explanatory document entitled "Objectives and Scope".

The GIT as part of the Part F Scheme

25. An important point to bear in mind is that part F has a number of elements, all of which are required to operate together to contribute to the achievement of the Commission's part F, and broader, objectives. Whilst the GIT is a key element of this framework, the Commission in proposing the GIT is not completing the implementation of all of part F. The GIT alone does not reflect all elements of the framework, nor all elements of the Commission's statutory objects and outcomes.

26. The Commission therefore considers that, until all elements of part F are in place and have been seen in action, it will not be possible to fully assess the extent to which part F as so implemented will achieve its objectives over time.
27. The Commission recognises that it has an ongoing role to review the GIT itself, and to propose changes to the GIT and the broader part F framework where that may be appropriate to better achieve those objectives. The Commission will, therefore, keep the GIT under review as it implements and gains experience and understanding of part F.

The Recommendation

28. The immediate task of the Commission, however, in responding to the priorities set by the GPS as regards grid investment, is to implement part F in a timely fashion.
29. This recommendation is a key element of that process.

CONSULTATION WITH AFFECTED PARTIES

30. Under s172E(2)(b)(ii) of the Act, the Commission must consult with persons that it thinks are representative of the interests of persons likely to be substantially affected by the proposed rule. Under section 172F(1)(d) of the Act, the Commission is required to prepare a statement of proposal for the purposes of consultation under s172E(2)(b)(ii).
31. The Commission prepared a statement in accordance with s172F(2), which included a statement of the proposal, a statement of the reasons for the proposal, the Commission's assessment under s172F(1) of the Act, and other information the Commission considered relevant in relation to the determination of the most appropriate grid investment test.
32. The Commission provided the required statement of proposal in a discussion paper. The Commission's proposal was released for consultation on 24 September 2004 and gave participants and other stakeholders the opportunity to make submissions on the proposed amendment. A copy of the discussion paper was placed on the Commission's web site on 24 September 2004, which contained a notification about the proposed rule change. Additionally the Commission's Market Update dated 24 September 2004, was sent to participants and other stakeholders on the same day; it also contained a notification about the proposed rule change.
33. Submissions on the rule change proposal were received from the following parties:
 - Brian Tolley Corporation
 - Contact Energy
 - Counties Power
 - Eastland Network
 - Energy Information Services Limited (EIS)

- Electricity Networks Association (ENA)
 - EPOC (Electric Power Optimisation Centre)
 - Genesis Power
 - Meridian Energy
 - Major Electricity Users' Group (MEUG)
 - Mighty River Power (MRP)
 - Network Tasman
 - NGC
 - Norske Skog Tasman
 - NZPA (NZ Photovoltaic Association)
 - Orion New Zealand
 - PCE (Parliamentary Commissioner for the Environment)
 - PowerCo
 - Transpower
 - Trustpower, and
 - Vector Networks
34. A brief summary of the main points from submissions is provided below. Further detail is provided in the submissions summary in Appendix Four.
35. The Commission wishes to thank all submitters for their input into the consultation process. The Commission appreciates the effort and rigour contained in the submissions.
36. In general the submissions contributed greatly to the decision making process in the direction the Commission was to take in regard to the GIT.
37. As a point of clarification, it is noted that the operation of the GIT will be reviewed at a later date. This will follow the Commission gaining practical experience with the application of the GIT .

SUBMISSION SUMMARY

38. Comments were sought from submitters on seven key areas:
- (a) Objectives and scope;
 - (b) Purpose;
 - (c) Model parameters;
 - (d) Content of the base case;
 - (e) Project requirements;
 - (f) Project evaluation; and
 - (g) Overall assessment against objectives.
39. The rest of this section summarises submissions and proposes a response and explanation for publication on the Commission's website.

Objectives and Scope

40. Comments were sought from submitters regarding the interpretation of the objectives, the specification of the principal purpose, and how to apply the GIT to reliability investments.

Objective

Submissions

41. Submissions on the objective related to four main issues:
- (a) Broadening the objectives beyond the electricity industry;
 - (b) Deepening the objectives to capture strategic values to the electricity industry;
 - (c) Concern about Transpower having veto power over grid investment; and
 - (d) Minor changes to better define the scope and application of the GIT.
42. In regard to (a), many submitters called for a broader interpretation of the objectives of the GIT, to include either a net public benefits test or wider energy transport issues such as gas transport, other government policies etc. Some submitters cited rule 6.3.1 of section III of part F as requiring the Commission to adopt a broader focus than it did in the consultation paper. Other submitters noted the practical and political difficulties and dangers of applying a broader objective.
43. Meridian commented at length on the legal and regulatory framework for the developing the GIT objectives. They claim the Commission has given too much weight to the objectives for developing the GIT (specified in rule 6.3 of section III of part F of the Rules), and not given sufficient weight to the purposes of section III (specified in rule 2 of section III) or to the objectives and outcomes specified in the GPS. These issues are discussed in detail below.
44. In regard to (b), some submitters were concerned about a piecemeal approach to assessing grid investment, in which proposals to upgrade components of the grid would be assessed without taking into account wider strategic benefits of the overall grid. According to Meridian, these wider benefits include technical benefits affecting ancillary services and system security, wholesale market impacts in respect of competitive effects or reductions in trading risks, and a greater range of supply and demand-side investment opportunities.
45. Some submitters called for a net public benefits test or a wider definition of benefits in the GIT or for a strategic approach. Other parties support the Commission's interpretation of the part F objectives.
46. In regard to (c), the Parliamentary Commissioner for the Environment (PCE) expressed concerns over rule 6.3.6 of section III of part F, which states that in developing the GIT the Board must have regard to facilitating outcomes

that are acceptable to Transpower and designated transmission customers. PCE's concern is that such a rule might give Transpower and certain customers a veto right over alternatives to transmission and could be seen as anti-competitive.

47. In regard to (d), some submitters thought it would be useful to clarify that the GIT assessment is restricted to outcomes in New Zealand, and one submitter suggested that retailers should be included in the list of parties that produce, distribute, and consume electricity.

Commission Response

48. In regard to (a), the Commission believes it has developed the GIT having regard to the objectives specified in rule 6.3 of section III of part F and bearing in mind (1) the functions of the GIT specified in rule 6.2 of section III, (2) the purposes of section III as described in rule 2 of section III, and (3) the GPS objectives and outcomes.
49. In regard to rule 6.3, the Commission has considered what each clause means and how the GIT promotes each clause. In particular:
- (a) The Commission interprets rule 6.3.1 as meaning economic efficiency arising from transmission arrangements and the wholesale market. In regard to the GIT, this requires looking through commercial arrangements to identify the full economic costs and benefits of transmission investment and its implications on the wholesale market. For example, it implies incorporating environmental effects of a transmission investment in the GIT and also taking into account the use of resources from other segments of the economy (such as the gas industry) that may be priced in ways that do not reflect the economic costs to New Zealand.
 - (b) The Commission interprets rule 6.3.2 as referring to end users' views about the benefits and costs of grid reliability to them, which contrasts with rule 6.3.3, which the Commission interprets as taking a broader economic assessment of the same factors. In regard to the GIT, rule 6.3.2 requires the Commission to estimate end users' value of lost load (VOLL) and use that estimate in the GIT. Rule 6.3.3 requires the Commission to use the GIT to choose investments that achieve reliability levels that achieve a balance between the economic benefits and the economic costs of different reliability levels.
 - (c) The Commission interprets rule 6.3.4 as referring to economic benefits accruing to, and economic costs falling on, those who produce, distribute, and consume electricity. This is narrower than rule 6.3.1, which refers to economic efficiency generally without reference to who receives the economic benefits and costs. The Commission believes the purpose of this narrower objective is to focus its attention on developing a GIT that is tractable and captures the key sources of economic costs and benefits rather than one that is comprehensive but intractable and unnecessarily speculative.

- (d) The Commission interprets rule 6.3.5 as meaning to promote certainty for parties making, or planning to make, investment in transmission, generation, and transmission alternatives and investment contracts. In regard to the GIT, rule 6.3.5 requires the Commission to develop a GIT methodology that is based on a clear and robust economic and policy framework so that it will be sustainable in the long-term and evolve in predictable ways as circumstances change and as the Commission, Transpower, and participants gain experience with it.
 - (e) The Commission interprets rule 6.3.6 as meaning to adopt methods and processes that facilitate outcomes acceptable to Transpower and designated transmission customers. The Commission interprets “acceptability of outcomes” in terms of parties expressing comfort that robust and transparent methods and processes were adopted to reach the outcomes, rather than that each party agrees with the outcome, which is highly unlikely given the divergent commercial and policy interests of the various parties.
50. The Commission has also considered the relative weights that should be given to each clause, having regard to rule 2 and the GPS objectives and outcomes where there is a conflict. As noted in paragraph 31 of the consultation paper, the Commission views the primary area of conflict to be between rules 6.3.1 and 6.3.4. The Commission believes the other clauses in 6.3 are components of the overall requirement to maximise total net benefits specified in rule 6.3.4, and therefore each is weighted in the GIT according to their contribution to total net benefits.
51. Rules 6.3.2 and 6.3.3 are components of total net benefits because reliability affects end users’ ability to consume electricity, and consumption of electricity yields economic benefits. Likewise, rule 6.3.5 is a component of total net benefits because reducing uncertainty for investors (by reducing regulatory risk) increases economic benefits by better aligning commercial risks with underlying economic risks, which leads to more efficient utilisation of capital resources. Rule 6.3.6 is a component of total net benefits because facilitating outcomes acceptable to Transpower and designated transmission customers will result in a more sustainable methodology, which reduces regulatory risks and encourages investment.
52. In regard to the conflict between rules 6.3.1 and 6.3.4, the Commission has considered the relative weights that should be given to each clause having regard to rule 2 of section III. In particular:
- (a) Rule 2.1 states that a purpose of the rules in section III is to facilitate Transpower’s ability to develop and implement long-term plans (including timely securing of land access and resource consents) for investment in the grid. The Commission believes this lends weight to specifying a test that is tractable and constrains the Commission to make consistent judgements over time and across projects. This supports greater weight to rule 6.3.4 rather than 6.3.1.
 - (b) Rule 2.2 states that a purpose of the rules in section III is to assist participants to identify and evaluate investments in transmission

alternatives. The Commission believes this also lends weight to specifying a test that is tractable, so that participants can use the GIT to evaluate their own proposals against Transpower's. This also supports greater weight to rule 6.3.4 rather than 6.3.1.

- (c) Rule 2.3 states that a purpose of the rules in section III is to facilitate efficient investment in generation. The comments above regarding rule 2.1 apply here, because the Commission's influence on generation investment arises from the strategic interdependence of transmission and generation. By facilitating efficient transmission investment, the Commission is facilitating the efficient location and timing of generation investment but it is the investors themselves that determine that investment, having regard for the regulatory environment they face.
 - (d) Rule 2.4 states that a purpose of the rules in section III is to facilitate any processes pursuant to Part 4A of the Commerce Act 1986. The Commission believes that this rule does not imply any particular weighting for rules 6.3.1 relative to 6.3.4.
 - (e) Rule 2.5 states that a purpose of the rules in section III is to enable the cost of approved investments to be recovered through the transmission pricing methodology applied in transmission agreements. Again, the Commission believes this rule does not imply any particular weighting for rules 6.3.1 relative to 6.3.4.
53. The Commission has also had regard to the GPS objectives and outcomes in balancing the conflict between rules 6.3.1 and 6.3.4. In regard to the principal objectives in the GPS:
- (a) The Commission is to ensure that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable, and environmentally sustainable manner. This focuses on electricity to all classes of consumers, which lends weight to rule 6.3.4 rather than to rule 6.3.1. That is, the focus is on electricity rather than other areas of the economy; and
 - (b) The Commission is to promote and facilitate the efficient use of electricity. This also focuses on electricity rather than other areas of the economy.
54. The Commission also had regard to GPS objectives for the provision of transmission services (paragraph 80 of the GPS) in weighting clauses 6.3.1 and 6.3.4:
- (a) The services are provided in a manner consistent with the Government's policy objectives for electricity, which are specified in paragraph 2 of the GPS as follows:
 - i. Energy and other resources are used efficiently. This lends weight to rule 6.3.1 as efficiency is not constrained to just the electricity sector;

- ii. Risks (including price risks) relating to security of supply are properly and efficiently managed. This also lends weight to rule 6.3.1 as efficiency is not constrained to just the electricity sector;
 - iii. Barriers to competition in electricity are minimised for the long-term benefit of end-users. This lends weight to rule 6.3.4 as it mentions barriers to competition in electricity rather than competition between electricity and other energy sources;
 - iv. Incentives for investment in generation, transmission, lines, energy efficiency, and demand-side management are maintained or enhanced and do not discriminate between public and private investment. This lends weight to rule 6.3.1 as it includes reference to energy efficiency not just electricity efficiency;
 - v. The full costs of producing and transporting each additional unit of electricity are signalled. This lends weight to rule 6.3.4 as it includes references to the production and transportation of electricity and does not mention other modes of transporting energy;
 - vi. Delivered electricity costs and prices are subject to sustained downward pressure. This is a commercial criterion and does not lend weight to either rule 6.3.1 or 6.3.4;
 - vii. The electricity sector contributes to achieving the Government's climate change objectives by minimising unnecessary hydro spill, efficiently managing transmission and distribution losses and constraints, promoting demand-side management and energy efficiency, and removing barriers to investment in new generation technologies, renewables and distributed generation. This lends weight to rule 6.3.1 as it includes reference to energy efficiency not just electricity efficiency, and mentions the need to remove barriers to investment in new generation technologies;
- (b) The services should be provided at the standards of power quality and grid reliability required by grid users and consumers as determined by the Electricity Commission. This does not lend weight to either rule 6.3.1 or 6.3.4;
- (c) The efficiency of transmission services should be continuously improved so as to produce the services grid users and consumers want at least cost. This does not lend weight to either rule 6.3.1 or 6.3.4 as it refers to the productive efficiency of transmission services;
- (d) The services are priced in a manner that:
- i. Is transparent. This does not favour rule 6.3.1 or 6.3.4 as it is referring to transparency in the transmission pricing methodology, not to the GIT;
 - ii. Fully reflects their costs including risk. This does not favour rule 6.3.1 or 6.3.4 as it refers to the cost of transmission rather than to the cost of other modes of transport;

- iii. Facilitates nationally efficient supply, delivery and use of electricity. This does not favour rule 6.3.1 or 6.3.4 as it refers to the transmission pricing methodology not to the GIT;
 - iv. Promotes efficient investment in transmission or transmission alternatives. This does not favour rule 6.3.1 or 6.3.4 as it refers to the use of transmission pricing to promote efficient investment;
 - v. Promotes nationally efficient use of transmission services by grid users and consumers. This does not favour rule 6.3.1 or 6.3.4 as it refers to the use of transmission pricing to promote efficient use of transmission services.
55. Although some of the above considerations lend weight to rule 6.3.1, most of them lend weight to rule 6.3.4, and in particular the principal objective of the Commission and rule 2 of section III of part F. In many respects rule 6.3.4 is a subset of 6.3.1. Bearing these factors in mind, the Commission has given some weight to 6.3.1, as it is requiring positive and negative externalities to be incorporated into the GIT to the extent that they reflect Government policy and to the extent they are explicitly priced. Issues like RMA requirements and supply diversity should be accounted for in the definition of project costs and the requirement for sensitivities to be conducted.
56. Overall though, the Commission believes it is appropriate to give primary weight to rule 6.3.4 (and its components in 6.3.2, 6.3.3, 6.3.5, and 6.3.6) until such time as a broader GIT can be more tractable and less speculative, which may require revision of the rules.
57. The Commission does not believe rule 2, in and of itself, can be interpreted, as Meridian implies, as requiring the Commission to approve Transpower to proceed to undertake major grid investment. The Commission appreciates the urgency with which grid investment decisions are needed, which is reflected in the timelines specified in paragraph 96 in the GPS. The Commission is proceeding to develop and implement a GIT to meet the GPS timelines.
58. It appears that some submitters object to the intent of part F and are seeking to re-litigate this. The policy framework underpinning part F, and rule 6.3 in particular, is set out in "MED Explanation of decisions and responses to submissions on Part F Transport rules - 18 March 2004 – section 5.3.2." Broadening the scope of the GIT would require a revision of part F rules.
59. In regard to (b), the current objectives for the GIT allow it to consider wider strategic factors, as these can be provided for if Transpower proposes a grid upgrade plan for the overall grid. Even on a part-by-part basis, wider strategic benefits can be included in the analysis using real options analysis.
60. In contrast to the views of some submitters, the Commission believes strategic and qualitative factors may also arise in regard to alternative projects as well as grid investment. For example, in the absence of grid

investment, new generators or demand side initiatives may enter the market in constrained regions and bring competition for consumers in those regions. They may also assist with supply diversity and generation optionality, because load growth would return the grid back to a state where grid investment will need to be considered again after only a few years.

61. The Commission intends retaining the principle of quantifying all aspects of its GIT assessment so that decision-making is transparent and so that the consistency of decision-making can be tracked over time and across assessments. Indicating a numerical range for these factors informs parties of the relative significance of the issue to the GIT decision. Strategic and qualitative factors can be difficult and subjective to quantify. As far as possible the Commission has sought to establish quantification of other factors that also have a degree of subjectivity such as VOLL, competition benefits, or the value of real options, all of which are currently required in the test.
62. In regard to (c), the Commission does not believe rule 6.3.6 of section III of part F gives Transpower veto rights over alternatives to transmission. The rule requires the Commission to develop a methodology for the GIT that facilitates outcomes acceptable to both Transpower and designated transmission customers. Giving Transpower veto rights in grid investment decisions would not facilitate outcomes acceptable to designated transmission customers.
63. In regard to (d), the Commission will revise clause 23 and 27 of the draft GIT to make it clear the geographic coverage of the GIT is New Zealand. The Commission will also include electricity retailers in the list of parties comprising the market, to minimise the risk of artificial distinctions in project benefits and costs.
64. For example, suppose some time in the future New Zealand has independent electricity retailers with no generation. Suppose a grid investment removes grid congestion for 20 - 30 years, creating a more competitive retail market and reducing profit margins for retailers. If retailers are not included in the definition of market benefit then lower retailer profits, which are wealth transfers to consumers, are taken into account in the net market benefits of a proposal. This would bias the decision in favour of grid investment because only the efficiency gains from competition should be taken into account.

Purpose

Submissions

65. Submissions on the purpose of the GIT related to four main issues:
 - (a) Location signals;
 - (b) Funding of transmission alternatives;
 - (c) Responsibility for grid investment decisions; and

(d) Remedial issues.

66. Some parties wish to widen the purpose of the GIT to reflect their concerns about the interpretation of part F objectives. These issues were dealt with in the previous section, and are not repeated here.
67. In regard to (a), several parties questioned whether the GIT would provide effective location signals, while others expressed reservations that a principal purpose of the GIT was to provide location signals, arguing this was a separate issue for the pricing methodology or counter party contracts.
68. In regard to (b), several submitters questioned whether the GIT would be effective without funding of alternatives, as otherwise the Commission could not be assured of a market response to the absence of grid investment.
69. In regard to (c), Transpower argued the GIT shifts responsibility for grid investment and grid performance to the Commission. In particular, Transpower argues that the proposed GIT framework would effectively remove the ability for Transpower to propose investments based on its own reasonable judgement of future transmission requirements, having regard to the contractual obligations, accountability and liability placed on Transpower as grid service provider.
70. Transpower objects to the GIT being based on future market development scenarios devised by the Commission. It argues that the application of the GIT must allow Transpower to adopt its own reasonable assumptions and analysis when proposing grid investments. Transpower labels the Commission's proposal as "central planning" and argues there must be flexibility in the application of the GIT to allow those that are accountable for the consequences of transmission investment to incorporate the necessary judgement in decision-making. Concerns about central planning were raised, from different view points, by other submitters as well.
71. In regard to (d), Transpower wanted a looser test so that a transmission investment would only need to show a net benefit. There was also confusion among some submitters over the purpose of the GIT, with some submitters expressing the view that the wording of paragraph 32(a) of the consultation paper was designed to ensure that transmission would always be the best option compared with alternatives.

Commission Response

72. In regard to (a), the Commission has decided to retain the reference to location signals in its statement of the principal purposes of the GIT. This is because the GIT will implicitly provide those signals by virtue of supporting or rejecting transmission upgrade proposals. The effectiveness of those signals depends on the extent to which investors believe the test will be applied consistently over time and the extent to which the Commission believes it can rely on a market response to those signals.¹

¹ The effectiveness of location signals is dealt with in the consultation paper "Proposed Guidelines for Transpower's Pricing Methodology," released on 24 September 2004.

73. In regard to (b), the Commission reiterates its statement in the consultation paper that the mandate it has under part F is limited to approving or rejecting grid upgrade proposals from Transpower. The Commission intends issuing a separate consultation paper to further consult on the merits of funding alternatives to transmission or not.
74. In regard to (c), the division of responsibilities between the Commission and Transpower was created by part F, not by the GIT. This division of responsibilities was the specific intent of the Government in establishing part F. Under part F, the Commission is responsible for setting grid reliability standards. Under other parts of the Rules, the Commission contracts with the system operator and other parties to meet the requirements of the Rules. While the detailed aspects of the transmission service definition are yet to be developed, fundamentally, in addition to specific part F process requirements, Transpower is responsible for making sure the assets they provide are available and work properly.
75. As grid owner, Transpower is not solely responsible for the performance of the power system as a whole, which also depends on the actions of the system operator, the performance of assets connected to the grid, and the market behaviour of generation and load. Transpower, as grid owner, is effectively the monopoly provider of transmission assets and would face strong conflicts of interest if it could approve its own investments and select between transmission and transmission alternatives.
76. Since it is consumers that end up paying for new investments, the Commission's role is to provide the kind of 'checks and balances' on the supplier of services that would be provided in normal markets, as these are absent in transmission because consumers cannot choose their own transmission service provider. The regulator acts on consumers' behalf to ensure new investment occurs only where consumers, in aggregate, value that investment sufficiently to pay the price proposed. The GIT is used to make those decisions in a transparent fashion to minimise regulatory risk.
77. Readers should note that under current part F rules (rule 5 of section II) Transpower and transmission customers can agree a variation in the grid reliability standards and thus agree investments covered by investment contracts. It would be unreasonable for the Commission to interpose itself between Transpower and parties with which it had investment contracts.
78. The current rules do not make it clear that the GIT should only apply where an investment contract has not been entered into. Proposed clause 3 (b) potentially could require Transpower to apply the GIT to all investment decisions, regardless of whether a commercial agreement had already been entered into. The Commission intends to clarify the purpose of the GIT in section III of part F to make it clear that it does not apply where Transpower has been able to agree an investment contract with transmission customers.
79. In response to Transpower's submission, the GIT has been clarified to allow Transpower or proponents of alternatives to propose alternative market development scenarios, which the Board may approve for use in the GIT. This flexibility has been introduced to cater for situations where the market

development scenarios in the statement of opportunities (SOO) are not sufficiently detailed to assess a proposed investment, such as an investment in a regional spur line. It also caters for situations where circumstances change materially between the time the SOO was published and the time the GIT is applied.

80. In regard to (d), the Commission has decided to amend paragraph 32(a) in the consultation document from “Establish that...” to “Establish whether...” to clarify that the GIT is intended to determine whether transmission is the best option available.
81. The Commission has decided not to adopt Transpower’s suggestion that a transmission investment only needs to show a net benefit. This would not be consistent with rule 6.3.4 of part F, which requires the Commission to have regard to maximising total net benefits, and it would also bias decisions in favour of grid investment.

Reliability investments

82. Submissions were sought on the proposal to use a cost-benefit test, based on probabilistic planning analysis, even if a deterministic grid reliability standard is adopted, and to apply the cost-benefit test to all reliability investment proposals.

Submissions

83. Submissions on the application of the GIT to reliability investments discussed the following:
 - (a) Deterministic versus probabilistic standards;
 - (b) Cost-benefit versus cost-effectiveness tests; and
 - (c) Other issues.
84. In regard to (a), most submitters expressed a view about whether the Commission should adopt a deterministic or probabilistic grid reliability standard. The question was not seeking views on that issue, but rather views on whether a cost-benefit test can be adopted even if a deterministic standard was adopted. Having said that, it is useful to note strong support for probabilistic standards.
85. Transpower and MRP argued for a deterministic standard for the core grid so that investment is assured. MRP suggest that deterministic reliability standards should be applied to core grid assets and probabilistic standards to regional or connection assets. These suggestions appear to be driven by a concern that excessive regulatory oversight could lead to central planning of all transmission and generation investment. These issues are discussed later in the paper under the heading “Other issues raised by submitters”.
86. Some submitters seemed misled by the question, which included a reference to probabilistic planning analysis. Comments seemed to be

questioning why the Commission would have two types of standards operating alongside one another.

87. In regard to (b), there was widespread (but not universal) support for applying a cost-benefit test to all reliability investment proposals. Many noted that this was appropriate because investments are likely to produce both economic and reliability benefits.
88. In regard to (c), Transpower interpreted the question as asking whether all reliability investment proposals should be assessed by the GIT, whereas the Commission was asking whether both pure and hybrid reliability investments should be subject to a cost-benefit test (in contrast to the initial report from Frontier Economics which had argued for a cost-effectiveness test for some pure reliability investments). Transpower raised an issue about the threshold for reliability investments, which is discussed under the "application threshold" section below. Transpower also argued the GIT should only apply to "regulated" projects, which is discussed in the "application threshold" section below.

Commission Response

89. In regard to (a), the Commission intends to issue a separate consultation paper on the form of grid reliability standards, and so will address the determination of the form of these in due course.
90. In regard to (b), the Commission intends to adopt its proposal to apply the same test to both economic and reliability investments, and to apply the same test to both pure and hybrid reliability investments. The Commission believes that distinguishing between pure and hybrid reliability investments would distract the Commission and the industry into arguments and disputes about the definition of an investment proposal.
91. The Commission intends to adopt the cost-benefit approach to the GIT. This issue has been covered in the Transmission Advisory Group (TAG) report to the Board dated 06 August 2004. The Commission intends to propose that a deterministic trigger be used to identify potential reliability investments but they would still be subject to a cost-benefit test. These customers would not be required to pay for a standard of reliability higher than their aggregate value of reliability.
92. The process can be viewed as a two-stage process for filtering investment proposals. An investment would be proposed as a reliability investment if justified on the basis of the deterministic trigger. However, probabilistic planning analysis would still be used to determine if the proposal offered the highest net market benefits to those who produce, distribute, and consume electricity.
93. In particular, probabilistic planning analysis would be used to assess alternative options for meeting the reliability requirement. For example, rather than build a second line into a remote location it may be more efficient to install a back up generator. If a deterministic standard is used to both identify reliability investments, and select the proposed project to meet the

requirement, as proposed by Transpower, then proposals that could bring higher net market benefits could be rejected.

Model Parameters

94. The Commission sought submissions on the discount rate, the timeframe, the costs of unserved energy, and the application threshold.

Discount rate

95. The Commission proposed using Transpower's weighted average cost of capital (WACC) as the initial discount rate to be used in the GIT. This was due to concern at the practical difficulties associated with unambiguously determining appropriate figures for particular projects and the limited time available to research alternative private WACC figures.

Submissions

96. Submissions on the discount rate raised the following issues:
- (a) Whether a single rate or project-specific rates should be used;
 - (b) Whether Transpower's regulated WACC should be used, or whether research should be conducted to determine a more appropriate WACC; and
 - (c) Whether the choice of discount rate was likely to affect GIT choices.
97. In regard to (a), some submitters agreed with the Commission's proposal to conduct the initial GIT using Transpower's WACC, whereas other submitters preferred the Commission apply different rates to different projects and preferred researching what those rates should be before applying them in the GIT.
98. In regard to (b), views were mixed on whether Transpower's WACC was an appropriate discount rate to apply in the short term. Transpower itself suggested a pre-tax real rate of 7% in the short term. Some submitters expressed concern that Transpower's WACC is not set externally, and raised the issue of the potential for Transpower to manipulate its WACC.
99. Most submissions suggested more research was required to determine the right discount rate, but there was some disagreement over whether research was a precursor to application now. Some submissions argued there was sufficient time for the Commission to come up with an alternative figure, for example, by relying on work by the Commerce Commission.
100. In regard to (c), virtually all submitters acknowledged that the discount rate could have an impact on project choice under the GIT. Many submissions noted that this was highly dependent on the pattern of project cash-flows. MRP agreed that the discount rate would not greatly affect GIT decisions.

Commission Response

101. In regard to (a), the Commission agrees with submitters that the theoretically correct approach would be to assess proposals at their project specific WACC. Although this approach is adopted by businesses in their investment decision-making, the Commission believes it is not appropriate for the GIT because neither Transpower nor the Commission will have robust information on the risk characteristics of investor proposals to reliably estimate WACC's for each proposal, especially if there is no proponent for a transmission alternative.
102. Adopting project specific WACCs would introduce the potential for greater inconsistency and regulatory uncertainty in GIT decisions, which would not be consistent with the purpose of the GIT. It may also result in controversy if the Commission incorrectly estimates an investors WACC. The Commission also believes adopting project-specific rates would run a risk of not meeting the Government's timetable for grid investment, as it is likely to delay the application of the GIT until research on the WACC is completed.
103. It should be noted that the Commission has received specialist advice on the issue of the appropriate value of WACC. This report was commissioned to SAHA International, who furnished their final report on 30 November 2004.
104. In regard to (b), Transpower does not have an appropriately regulated WACC that can be used in the GIT. The Commission has decided to adopt Transpower's suggestion of a 7% pre-tax real rate as an initial value, and test the sensitivity of the results to alternative discount rates. Clause 14 provides for the Commission to revise the discount rate at a later date.
105. The Commission does not believe it would be more appropriate to use rates for other lines businesses determined by the Commerce Commission, as those rates are not project specific. The Commission intends to consider at a later stage whether it should undertake further research on the WACC to apply in assessing grid upgrade proposals and alternatives projects.
106. In regard to (c), the Commission believes the WACC is unlikely to have a significant impact on GIT decisions, as alternatives to transmission typically delay grid investment for only a few years. The relevant timeframe is the deferral time of the transmission investment, not the asset life of the project. However, the Commission has modified the GIT to allow evaluation of the sensitivity of specific alternative projects to individual discount rates.

Timeframe

107. It was proposed to adopt a 20-year timeframe for the GIT and to include terminal values if substantial net benefits are expected beyond the 20-year timeframe.

Submissions

108. Most submitters either agreed with the 20-year timeframe, or a 20-year timeframe with terminal values. Some submitters preferred a longer

timeframe, extending to 40 years, but without terminal values. One submitter proposed a shorter timeframe on the basis that the purpose of the GIT is limited to discovering if alternatives to transmission can delay grid investment.

109. Submitters suggested terminal values should be applied when the project has a life expectancy exceeding 20 years. However the key issue will be verification of assumptions for benefits beyond 20 years.

Commission Response

110. The Commission intends to retain its proposal to adopt a 20-year timeframe with terminal values if needed, as this is supported by the majority of submitters. The Commission will consult on the methodology for calculation of terminal values.
111. The Commission notes that, although transmission assets last longer than 20 years, the discount rate considerably reduces the effect of adding additional years to the analysis, unless the net benefits of transmission increase rapidly over time. If that occurs it can be captured by adding a terminal value. The Commission also notes that the 20-year timeframe is already longer than the 10-15 year period applied to date in the National Electricity Market (NEM) under the Regulatory Test.
112. As with the discount rate, adding additional years to the time frame will affect GIT decisions less than most submitters realise. This is because, as one submitter noted, the decision is about choosing whether a transmission alternative achieves a better outcome than the proposed grid investment. Transmission alternatives generally only delay a grid investment for 5 to 10 years. Therefore, the relevant time frame is mostly only 5 to 10 years, in regards to choosing between transmission alternatives and grid investment.

Cost of unserved energy

113. The Commission proposed an initial value for unserved energy of \$20,000 per MWh and sought submissions on whether parties were aware of other empirical studies, whether a central or separate values should be used, and what sensitivities should be used where a project warrants additional analysis.

Submissions

114. There was a wide range of views on what the appropriate value for unserved energy should be. Industrial groups and submitters with urban customers favoured a higher value, while submitters with rural customers favoured a lower value. Many submitters suggested a survey to establish "correct values" for unserved energy. The only hard evidence provided was the CRA study on VoLL, provided by Meridian, which supports the \$20,000 figure adopted initially.
115. There was general support for a central value for unserved energy, based mainly on the practical difficulties of doing anything else. Those who

preferred different values suggested a survey of customers by GXP to determine values.

116. There was no support for differential charging, based on a different value of unserved energy per GXP.
117. There was mixed support for sensitivity analysis and the values chosen. Some parties did not support sensitivity analysis at all and suggested an alternative evaluation approach (stochastic programming). Others suggested more analysis over the range of sensitivities chosen.

Commission Response

118. The Commission intends to adopt \$20,000 per MWh as the initial central value for unserved energy, as proposed. The Commission asked submitters whether a \$20,000 value reflected a balanced assessment of current New Zealand and international evidence. This was not strongly contested by submitters. The Commission notes the CRA study, provided by Meridian in their submission, which supports the \$20,000 figure.
119. The Commission appreciates the need to consider whether to conduct a further survey to research appropriate values for unserved energy. The Commission intends to publish the work currently being undertaken by the Centre for Advanced Engineering (CAE) and intends consulting on it as part of consultation on grid reliability standards.
120. It is impractical to provide, or charge, for different levels of reliability to different consumers at a single GXP (refer Contact Energy's submission). There is a strong incentive for some grid users to "free ride" by claiming that they require a lower reliability standard while continuing to receive a higher standard. Ideally parties wanting to actually receive a lower level of reliability should be able to provide this as a demand response form of transmission alternative. Therefore, the value of unserved energy adopted should represent an aggregate for all consumers who benefit from transmission investment.
121. As stated in its consultation paper, the Commission intends conducting sensitivity analysis with the \$10,000 and \$30,000 values as a pragmatic starting point.

Application threshold

122. The Commission proposed an application threshold of \$1 million, with the GIT to be applied with less rigour between \$1 million and \$5 million. It sought submissions on the application threshold and what level of rigour should be applied for investments below \$5 million.

Submissions

123. Submitters thought that a threshold of \$1 million was too low for the application of the GIT, and many of them argued in favour of a \$5 million threshold. One submitter argued for a \$20 million threshold for investments in the core grid. The \$5 million threshold is seen by some as necessary to

avoid the administrative overheads of the lower limit, and undue interference in the operations of Transpower.

124. On the other hand, several submitters were concerned that Transpower could 'game' the threshold by breaking up projects to fit below it. One submitter suggested the Commission should have discretion to apply the GIT to investments below \$5 million to avoid incentives to split a large project into smaller ones.
125. Most generators and Transpower favoured a \$5m limit. Distributors favoured the proposed limit but call for the "less rigorous approach" to be defined.
126. Several submitters suggested the GIT should only apply to investments that are not agreed between Transpower and the relevant counter party.
127. MRP proposed that core grid investment decisions below \$20 million should not be required to be assessed against transmission alternatives. This proposal seems to be driven from concerns that the proposed GIT process will be overly cumbersome to implement, will unnecessarily delay essential grid investment, and could lead to overly intrusive regulatory oversight that could lead to "central planning" of generation and transmission investment.

Commission Response

128. The Commission believes it is important the GIT promotes transparency and certainty. Should Transpower wish to receive approval for funding, then they are required to present the project for evaluation under the GIT. The Commission believes the rigour applied to the GIT should be commensurate to the level of capital costs, and introduced a specific clause to require this.

Contents of the Base Case

129. The Commission sought submissions on the variables it should include in the description of the current state of the electricity industry, the risks of incorrect modelling, least cost versus bidding approaches, sensitivity analysis on bidding and a set of criteria for committed, anticipated and modelled projects.

The current status of the electricity industry

130. The Commission sought submissions on the variables it should include in the description of the current state of the electricity industry.

Submissions

131. Most submitters either thought the proposed variables describing the existing industry were reasonable or had no comment. A few mentioned the need to consider the status of gas/fuel supply (Eastland, ENA, Meridian, Norske Skog) while MRP mentioned the load duration curve, and Orion wanted significant potential load reductions through industry closures to be included in the list.

132. Meridian also mentioned grid reliability standards and suggested that nodal prices rather than operating costs be used. Transpower suggested that it be made more explicit that generator fuel costs are included in maintenance and operation costs.

Commission Response

133. The Commission intends to retain the proposed list of variables to describe the current state of the electricity industry. The Commission believes fuel availability, load duration, and the potential for load reductions are implicitly included in the current list for the base case and future scenarios. The same applies for generator fuel costs.
134. The Commission intends to add grid reliability standards to the list of variables describing the current status of the electricity industry because the Commission intends to set standards having regard to net market benefits in the GIT. As these standards are required to have an economic basis they will therefore vary across the grid, and may change as new proposals are assessed in the GIT.
135. The Commission also intends to add nodal prices to the list. Although it intends to conduct the test based on least cost expansion plans, the Commission also intends to conduct sensitivity analysis of the results using the realistic bidding approach. It will therefore be necessary to relate that analysis to current nodal prices.

Future market development

136. The Commission sought submissions on whether it should develop future market development scenarios based on least-cost expansion plans, supplemented with sensitivity analysis of a 'realistic bidding' approach. The Commission also sought submissions on whether the choice between least-cost and 'realistic bidding' approaches would likely to materially affect the choice of grid investment versus alternatives to transmission.

Submissions

137. Most submitters understood that a key risk when considering the future of the industry was incorrectly forecasting generator investment patterns. As Meridian noted, this risk is inherent to the GIT process.
138. Many submitters recognised that the use of realistic bidding could lead to different outcomes to the least-cost approach, but many others had no comment or displayed some confusion over how bidding assumptions could affect the analysis.
139. For example, many submitters favouring the bidding approach appeared to do so because of wealth transfer effects, which are not included in the GIT. Consumers considered the least-cost versus bidding approach to be a significant issue.

140. Transpower was keen to preserve its discretion to utilise its own views on generation investment and bidding patterns. These issues were addressed in the discussion of the objectives and purpose of the test.
141. Transpower suggested that alternative market development scenarios, that were not included in the SOO, may be more appropriate than the future development scenarios contained in the SOO, and requested that they be given the discretion to use the alternative scenarios in the GIT.

Commission Response

142. The Commission intends to retain the least cost approach as it is the more tractable and pragmatic approach in the time available, and the realistic bidding approach will be considered in the future if sensitivity analysis shows that it materially affects GIT decisions.
143. The Commission appreciates that actual costs may differ from those in a least cost expansion plan, but the magnitude of the difference should not systematically bias decisions for or against grid investment in most cases. The 'realistic bidding' approach offers far greater risk of wrongly estimating the cost of alternatives. In practice, the estimated costs of proposed alternatives will be taken into account when they are evaluated.
144. The Commission has decided to amend clause 6 (a) to provide the Commission with discretion over the choice of market development scenario to use if circumstances change after publication of the SOO or if the market development scenarios in the SOO are not sufficiently detailed (e.g. in regard to regional proposals). Consequential amendments to clause 6 (c) arose from the deletion of "number of" in the definition of market development scenarios. This was in response to Meridian Energy's submission.

Committed and modelled projects

145. The Commission sought submissions on proposed criteria for defining committed and modelled projects, and also asked whether anticipated projects should be separately identified.

Submissions

146. Submitters generally agreed that the criteria for committed projects were reasonable.
147. There was very limited support for distinguishing between anticipated and modelled projects. Some submitters suggested anticipated projects should be merged with committed, while other submitters suggested it should be merged with modelled.
148. Distributors thought the description of modelled projects was clear but several suggested additional criteria. Transpower and most generators considered it was not sufficiently clear but did not indicate in what manner it was unclear. Transpower noted that if all three criteria were required to be satisfied, the definition of modelled projects would become very rigid and it

would be difficult to formulate alternative base case scenarios with different modelled projects.

Commission Response

149. The Commission has decided to adopt its proposed criteria for committed projects, and have adopted the following clarifications from Vector:
- (a) Deletion of the reference to environmental impact assessments in criterion (a) as these will have occurred if planning consents have been obtained;
 - (b) Inclusion of leased land in criterion (c); and
 - (c) Clarification of what is meant by the term “completed” in criterion (e).
150. The Commission has decided not to separately identify anticipated projects as doing so may create confusion and is unlikely to assist the Commission to determine the likelihood of the project occurring.
151. The Commission has decided to retain its proposed criteria for modelled projects. In regard to Transpower’s concern about the rigidity of the definition of modelled projects, the Commission believes the identification of projects in the SOO is a necessary but not sufficient condition for a project to be a modelled project. This would allow some flexibility in the setting up of alternative projects within the base case scenarios.

Existing and decommissioned projects

152. The Commission sought submissions on whether its description of existing and decommissioned projects was clear and unambiguous.

Submissions

153. Most submitters agreed with the definition of existing and decommissioned projects. Meridian requested confirmation that existing grid and generation are “existing projects” for the purposes of defining “decommissioned project”. Contact Energy asked how augmentations to existing generators would be handled.

Commission Response

154. The Commission, in the interests of clarity, has relabelled “existing projects” as “existing assets” and “decommissioned projects” as “decommissioned assets”.
155. The Commission has decided to refine the description of existing assets and decommissioned assets in clauses 24 and 25 to make it clear that:
- (a) Existing grid and generation are “existing assets” for the purposes of defining “decommissioned project;” and
 - (b) Capacity expansions to existing generators are treated as new projects.

Project Requirements

156. The Commission sought submissions on the criteria for selecting alternative projects, the benefits of projects, the costs of projects, and the inclusion of Government policies in the GIT.

Alternative project criteria

157. The Commission sought submissions on the criteria for selecting alternative projects for comparison with Transpower's grid upgrade proposals. The key issues include:

- (a) Whether an alternative project must have a project proponent;
- (b) Whether an alternative project should be contingent on a transmission investment not proceeding; and
- (c) The size and number of alternatives.

Submissions

158. In general there was a wide range of ideas regarding the criteria with most supporting the proposed criteria, however a few called for less criteria and one called for a greater number of criteria.

159. Submitters displayed mixed responses in regard to (a). Transpower supported the NEM requirement that a reliability project needs a proponent whereas an economic project does not. Orion, Powerco and Vector thought the need for a proponent was crucial, while Genesis and EIS thought a proponent was not necessary. Most submitters expressed the view that alternatives without proponents should not be included.

160. In regard to (b), several submitters argued that an alternative should not be contingent on a transmission project not proceeding, as this would exclude most DSM projects. Genesis reasoned that criterion 77(b) in the consultation paper implicitly added a commercial feasibility requirement, which would 'count out' projects that require transmission funding to be viable.

161. MEUG suggested the wording of criteria 77(c) in the consultation paper (which is clause 19(c) in the GIT) be amended to capture the acceptability of the alternative project to end-users.

Commission Response

162. The Commission has decided to retain the proposed list of criteria, and will review the criteria once experience has been gained with the GIT. The Commission has not adopted MEUG's suggestion that clause 19(c) require alternative projects to be acceptable to end-users because it would make GIT outcomes less certain and it raises practical implementation issues.

163. In the Commission's view criterion 77(b) in the consultation paper is necessary to identify projects that are alternative to grid investment. If a project will proceed irrespective of a transmission project, then it is not an alternative to grid investment.

Project benefits

164. The Commission sought submissions on the criteria for selecting alternative projects for comparison with Transpower's grid upgrade proposals. The key issues include:
- (a) Whether submitters agreed with the list of variables for calculating project benefits;
 - (b) Whether there were other variables that should be included; and
 - (c) Whether the variables were clear and understandable.

Submissions

165. Submitters displayed varied responses. There was general support for the current list, but several suggested a variety of other variables should be considered. Transpower argued for distribution network savings as well as a general 'catch all' provision. Meridian supported national strategic factors and qualitative factors such as competition, security of supply and diversity of supply.

Commission Response

166. The Commission has decided to retain the current list of benefits and add the benefit of reduced/avoided distribution costs to clause 27 in the draft GIT. Strategic and qualitative benefits are either included in the competition benefits clause or are covered by the clause allowing the GIT to include real options analysis.
167. The Commission does not agree with the suggestion that a 'catch all' provision be included in the list of benefits, as it would expose the GIT to lobbying by participants who stood to benefit from a particular augmentation.

Competition benefits

168. The Commission sought submissions on whether competition benefits should be included in the GIT and how they should be measured.

Submissions

169. There was general support among submitters for the inclusion of competition benefits in the GIT, with only one submitter expressing the opposite view. Many submitters believed that competition benefits should only be included if the competition benefits proved to be of a material nature or if a project was otherwise marginal.
170. Some submitters expressed concerns regarding the role of Transpower and the Commission in determining if competition benefits should be included.

Both Transpower and the ENA called for clarification of competition benefits to ensure it includes increases in consumer and producer surpluses rather than wealth transfers.

Commission Response

171. The Commission intends to include competition benefits in the calculation of market benefits where appropriate, and where separately identified and calculated. The Commission will revise clause 10 in the GIT to make it clear that the Commission, not Transpower, has the final decision rights on whether competition benefits are considered in the assessment of a grid upgrade proposal and alternatives to it. The Commission will also clarify in clause 22 of the draft GIT that competition benefits refer only to increases in consumer and producer surpluses.

Project costs

172. The Commission sought submissions on the variables to be included in the definition of the costs of the project, and whether Government policies should be included in the GIT.

Submissions

173. There was general support among submitters regarding the proposed list of variables. All parties were in favour of keeping the proposed list, with a few parties suggesting additional variables such as interest costs during the construction phase and the loss of existing plant when it is superseded by new plant. Meridian argued for allowing participant contributions to reduce a project's cost and help enable a project to be approved.

Commission Response

174. The Commission has decided to retain the proposed list of cost variables and include the interest costs incurred during construction as an additional variable in clause 23 of the GIT. The key issue here is consistency of treatment. The Commission will allow interest costs to be included in project costs when an accounting treatment is applied to capital costs, but not if the cash flow approach is adopted.
175. The Commission believes the cost of superseded generation is covered by clause 23(d) of the GIT.
176. The Commission has decided not to allow participant contributions to be taken into account in the GIT as they do not affect the net market benefits of a project. This contrasts with the part F provision for investment contracts, where grid users can pay Transpower to undertake investments, and these are not subject to the GIT. In practical terms, though, investment contracts do not require other parties to fund them, and so it is reasonable not to subject investment contracts to the GIT. This contrasts with participant contributions, which would have the effect of imposing costs on other parties if the contribution ensures an investment satisfies the GIT when it would otherwise not.

Government policies

177. The Commission sought submissions on the inclusion of costs or benefits that arise as a result of Government policies.

Submissions

178. Most submitters agreed that it was appropriate to include the cost of Government policies in a project's costs. Eastland Network argued that externalities such as a carbon tax and labour laws should be included. Some submitters argued that policy costs should only be included if they are legislated or legally enforceable, which was the intention of the proposed GIT.

Commission Response

179. The Commission has decided to retain its proposed approach to including the cost of Government policies in a project's costs, provided that they are explicitly priced. The proposed GIT includes carbon taxes as they will be an explicit cost imposed on the electricity market. The Commission believes that issues like restrictive labour laws are included in the GIT to the extent that they affect the price of labour.

Project Evaluation

180. The Commission sought submissions on the proposed project evaluation criteria. In particular, the Commission sought submissions on how to assess projects against the base cases, the approach of replacing proposed investments that are in the base case with alternatives, the sensitivity analysis parameters, and the use of real options analysis and decision rules.

Base case scenarios

181. The Commission sought submissions on the assessment of projects against several base case scenarios.

Submissions

182. There was general support from submitters regarding the Commission's approach to assessing projects against multiple base case scenarios. Some submitters expressed concern that probabilities assigned to the base cases would be arbitrary. There was also concern that the approach taken would be too complex and not yield an optimal solution.

183. Transpower was keen on maintaining discretion to adopt its own assumptions. Meridian and MRP questioned how multiple base cases could arise – in their view the base case should remain the same with sensitivities applied to various assumptions. Norske Skog and EPOC suggested stochastic programming should be used rather than multiple base case scenarios.

Commission Response

184. The Commission has decided to maintain its proposed methodology. The alternative approaches suggested by Meridian and MRP are in practice similar to the approach proposed by the Commission. This is an issue as to whether one applies a number of base cases or one base case with multiple sets of assumptions to reflect different future states of the world. The Commission acknowledges that stochastic programming may have value in the long term but has decided not to consider it at this stage because it would be difficult to apply in the timeframes available for completing the initial GIT.
185. In regard to Transpower's argument that it should be allowed to adopt its own reasonable assumptions where the SOO assumptions are not appropriate, the Commission notes that Transpower is required, under paragraph 87 of the GPS to submit the Grid Upgrade Plan to the Electricity Commission in a manner consistent with the forecasts in the SOO.
186. The assignment of probabilities will be dealt with under another section of the document.

Replacing proposed grid investments with alternatives

187. The Commission sought submissions on the proposal to replace proposed grid investments with alternative arrangements, should they be in a base case scenario.

Submissions

188. There was general support from submitters regarding the Commission's approach to replacing proposed grid investments with alternatives. Some submitters disagreed with this approach, but their views were consistent with their overall disagreement with the Commission's approach.

Commission Response

189. The Commission has decided to retain its proposed methodology as this will provide a robust basis to compare transmission alternatives.

Sensitivity analysis

190. The Commission sought submissions on the proposal to conduct sensitivity analysis on the list of parameters, and also asked whether other variables should be considered for sensitivity analysis.

Submissions

191. There was no clear direction from submitters regarding the parameters to be used. Some submitters suggested additional parameters to be added to the list, while others suggested that too many sensitivity variables were proposed. EPOC argued that if sensitivity analysis is applied too rigorously, it could lead to very few projects meeting the GIT requirements.

192. Eastland Infrastructure suggested carbon charge rates should be included in the list of sensitivity variables.

Commission Response

193. The Commission has decided to retain the proposed list of sensitivity variables and add a variable relating to the carbon charge. The Commission believes carbon charge levels may significantly affect likely generation scenarios and therefore alter GIT results. The Commission has also added a variable relating to the probability of the occurrence of a market development scenario, in response to several submitters' concerns regarding the use of probability weights.
194. The Commission intends to allow sensitivity analysis around the choice of discount rate for individual alternative projects, to determine whether the project specific discount rates would make a material difference to the GIT results.
195. The Commission intends to be pragmatic in determining the list of variables to undertake sensitivity analysis, which is made possible by clause 17 in the GIT, which gives the Commission the ability to remove sensitivity analysis on parameters that are not practicable or necessary. The Commission expects to do this as it gains experience with the GIT under various cases.

Real options analysis

196. The Commission sought submissions on the proposal to undertake real options analysis where practical.

Submissions

197. The general theme from submissions was support for real options analysis where practicable, but others questioned its applicability. A number of submitters were concerned about the complexity real options analysis could introduce into project assessment (with the risk of consequent delays) and many of these suggested that real options analysis be put aside at least for the present time.

Commission Response

198. The Commission has decided to allow both real options analysis and standard NPV analysis, with the particular analysis used being the one that is most appropriate for the situation. In the Commission's view, retaining the option for real options analysis is likely to be important for addressing strategic and qualitative factors raised by some submitters in the discussion of the overall objectives of the GIT.

NPV analysis decision rules

199. The Commission sought submissions on which decision rule should be used in determining the highest value project.

Submissions

200. There was general support for the probability-weighted approach among submitters, although some disagreed with the Commission's proposed initial approach of adopting equal probabilities. There was comment from submitters that they would like to see a robust and transparent process to determining the probabilities. ENA argued for a benefit-cost ratio to be used instead of standard NPV results. MRP did not support either the simple weighted average or the probability-weighted average as in their view the choice of probabilities fundamentally affects the end decision.
201. Meridian also commented that the Commission needs to exercise discretion if the sensitivity analysis creates an ambiguous result.

Commission Response

202. The Commission has decided to use the probability-weighted approach to determine the highest value project. The Commission intends to provide its base case scenarios in the SOO, and will provide its rationale for assigning equal probabilities to the base case scenarios at that time. The Commission also notes that there will be a consultation opportunity with the SOO.
203. The Commission consulted Professor David Newbery, an international expert on economic cost-benefit analysis at Cambridge University in England, regarding benefit-cost ratios. Professor Newbery confirmed that standard NPV analysis is the correct approach because the discount rate reflects, among other things, the scarcity of capital, which appears to be ENA's concern.²
204. The Commission has decided to add "the Board is reasonably satisfied that" to clause 4 to provide the Commission with the discretion to decide between the ambiguous results of the sensitivity analysis.

Decision rule between NPV analysis and real options analysis

205. The Commission sought submissions on whether a decision rule is required to choose between the NPV result and the real options result.

Submissions

206. The general theme from submitters was that there was a desire to leave this decision to the Commission's discretion. Several submitters suggested that a rule was required. Many submitters expressed views about whether real options analysis should be undertaken rather than comment on whether a decision rule was required.

² This discussion assumes there is no uncertainty and investments are reversible. If there is uncertainty and investments are irreversible then the scale of the investment matters, but the appropriate approach in this case is to conduct real options analysis.

Commission Response

207. The Commission has decided not to adopt a decision rule at this stage as it would unnecessarily complicate the GIT process. A rule can be adopted at a later date, should it prove necessary.

Other issues raised by submitters

Evaluation of non-transmission alternatives

208. Transpower proposes that it should be the party evaluating and contracting with providers of transmission alternatives. This issue is outside the methodology for application of the GIT and will be dealt with in a later consultation paper.

Avoiding excessive regulatory intervention

209. MRP's chief concern with the GIT process is "balancing the need for scrutiny of transmission upgrades (to avoid unnecessary transmission investment) with the undesirable effects of excessive regulatory oversight". They suggest an alternative regime that they consider achieves the right balance:

- (a) Grid assets to be categorised as core, regional, or connection;³
- (b) Applying a higher threshold for application of the GIT to \$20 million for core grid assets, and applying a deterministic grid reliability standard to investment in core grid assets. Probabilistic reliability standards would apply to regional grid assets; and
- (c) Only applying the GIT where there is a need for mandatory funding.

210. MRP's proposal seems to be driven by concerns that the proposed GIT process will be overly cumbersome to implement, will unnecessarily delay essential grid investment, and could lead to an overly intrusive level of regulatory oversight that could lead to "central planning" of generation and transmission investment. NGC also cautioned the Commission to be wary of the impact of the GIT upon private investment.

Commission Response

211. The Commission accepts MRP's concerns that the GIT application should not delay essential transmission investment and that the application should not be overly cumbersome. However the danger of deterministic grid reliability standards is that it could lead to rejection of transmission alternatives that would offer a net economic benefit to grid users. The Commission does not share MRP's view that adopting deterministic reliability standards would reduce the level of regulatory oversight or speed up essential grid investment.

³ MRP suggested core grid assets be defined as the group of transmission assets which, if failure were to occur on any one, would lead to a material probability that cascade failure would occur. Regional assets would be defined to be interconnected assets that are not defined to be core grid assets.

212. In regard to (c), MRP seem to share Transpower's concern about the GIT applying to all grid investments. As noted in the section entitled 'accountability for grid performance,' the GIT should not be applied when Transpower is able to enter into investment contracts with all the parties affected by a particular grid investment. In such cases regulated transmission funding is not required and the GIT would not apply.

Commission undertaking price projections

213. Contact Energy expressed concern about whether the GIT would involve the Commission expressing a view about future price projections, particularly via the SOO. Contact Energy's concern with the Commission producing such projections is that, as a regulator with the powers to make recommendations and give policy advice, far greater weight will be put on such projections by market participants.

Commission Response

214. At this stage the Commission intends to adopt the proposal to publish nodal price forecasts with the SOO, as this information will be used by the Commission anyway to conduct sensitivity analysis in the GIT on the realistic bidding approach versus the least cost expansion plan. The Commission believes that concerns about potential interference in the energy market are overstated, as the Reserve Bank forecasts interest rates and exchange rates without deleterious effect. These risks are further reduced by the fact that the Commission will be publishing price forecasts for each of five scenarios.

Open to interpretation

215. The ENA expressed concerns that the draft GIT could be open to interpretation, in the same way as the Australian Regulatory Test. ENA did not provide examples of the ambiguities in the GIT.

Commission Response

216. The Commission believes it has struck a practical balance between prescribing the grid investment test, which enhances confidence in the test, and flexibility to apply the test to circumstances as they develop. The initial applications of the GIT will provide an indication of how the Commission will consistently apply the GIT in the future. Frontier Economics have provided advice which reflects experience with the Australian Regulatory Test.

Overall Assessment Against Objectives

217. The Commission sought submissions on the overall assessment against the Commission's objectives.

Submissions

218. Most submitters did not make specific comment on the assessment in Table 2 of the discussion paper. Of those that did comment, the comments

reflected the overall submission and the views expressed by parties in their answers to previous questions.

219. For example, EIS argued that the table was incorrect primarily due to the narrowness of the GIT to electricity, limited consideration of externalities (those that were priced only) and lack of emphasis on demand-side management. MRP disagreed with the direction the Commission was taking the GIT; specifically, the complexity involved. Meridian sought inclusion of qualitative factors in the GIT.

Commission Response

220. The Commission intends to adopt the revised GIT for recommendation to the Minister of Energy. The Commission is expecting to further consult on outstanding issues at a later date. It should be noted that the initial version of the GIT can be revised by the Commission over time as allowed for in part F.